

SEA, LAND, AND AIR STRATEGY

A COMPARISON

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'LETTERS ON AMPHIBIOUS WARS,' ETC.

WITH MAPS AND DIAGRAMS

'Whoever writes on strategy and tactics ought not in his theory to neglect the point of view of his own people. He should give us a national strategy, a national tactics.'

VON DER COLTZ

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DEDICATED TO THE MEMORY OF
VICE-ADMIRAL
SIR GEORGE TRYON, K.C.B.
IN REMEMBRANCE OF HIS TEACHINGS
IN THE ART OF STRATEGY

P R E F A C E

PRIVATE letters and press notices from all parts of the world indicate that *Letters on Amphibious Wars* have achieved their purpose as an aid to studying the relationship between the operations of sea and land forces. The present work, like its predecessor, is based upon lectures delivered at the Staff College at Camberley in the years 1904-7, and experience gained since those days has been embodied, in order to bring the matter up to date.

On the subject of land strategy the reader has a very wide choice of books, but on sea strategy comparatively little has been written of late years. Admiral Mahan and Mr. Julian Corbett, in their important works on the subject, refer to the principles of war on land for the sake of comparison, and apply military terms and analogies to war at sea, a method which has been adopted in some cases in this book. Amphibious strategy, or the combined strategy of fleets and armies, treated as a special subject, has not yet received the attention which its importance deserves, and the Japanese have so far been the only exponents

of the art on a large scale under the conditions of modern warfare. Air strategy must be based largely on surmise until more experience is forthcoming of the employment of aircraft under war conditions.

There remains the question whether strategy is a subject upon which anything can be usefully written at all, or whether it can only be learned by the study of history, unaided by any special treatise. On this point I must await the judgment of readers.

In conclusion, I should like to take this opportunity of offering to those who have written to me about *Letters on Amphibious Wars* my sincere thanks for their letters, and of expressing the hope that this volume will attract the attention of some of my brother officers, at sea and on land, with whom it has been my good fortune to be friends during the past thirty-five years spent partly with the fleet, and partly with the army.

G. G. A.

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SEA, LAND, AND AIR STRATEGY

CHAPTER I

INTRODUCTORY

Seamen and soldiers—Influences on strategy—Peace strategy—British problem in 1907—At sea—On land—War strategy—Psychology of war—Movement in war—Finance and war—Population and war—Internal communications—External communications and sea power—Deductions.

HISTORIES of wars have been written from many points of view, but never from the point of view of those who conduct them. The seaman or the soldier looks forward, perhaps, to the time when the destiny of a nation or an Empire may depend upon his right judgment in council or in action, and if he has the elements of greatness in him he knows that success will depend in great measure upon himself, and upon the influence which his own knowledge and personality may have upon those with whom he is brought into contact. In order to train his judgment for the day when it will be tested, it is natural that he should seek the help of history in order to find guidance by studying the methods employed by great commanders in dealing with strategical and tactical situations, and the various influences and motives which led up to the line of action which they selected. For the most part he seeks in vain.

He can trace the movements of fleets and of armies in past campaigns, and information so obtained will be of value to him as an indication of what to expect from similar forces which he may himself have to handle, but he knows that war is not a simple matter of ordering movements. 'While the literary man is laying down the law at his desk as to how many troops should be moved here, and what rivers should be crossed there, and where the cavalry should have been brought up, and when the flank should have been turned, the wretched man who has to do the work finds the matter settled for him by pestilence, want of shoes, empty stomachs, bad roads, heavy rains, hot suns, and a thousand other stern warriors who never show on paper.'¹ The case could hardly be better put, and every seaman and soldier in a position of responsibility soon finds out the truth of the saying that in war everything is simple, but the simple is difficult.² For instance, taking an example from the branch of war study usually called strategy, to which we propose to devote particular attention, it is a fortunate commander who knows that there is a strong and lasting sentiment in the nation, as a driving power behind the forces he is handling, so that he has a free hand to carry out his plans to the best advantage without interference. If, in making such plans, he has only to think of the enemy's forces, and

¹ Charles Kingsley in *Westward Ho*.

² Clausewitz.

the best way to dispose his own so as to gain a victory, then his task is half done, but simple as it may seem in the best interests of a nation to ensure this freedom of action to commanders, in practice it is seldom possible.

As an illustration, it is not necessary to take more than one example at present, and we will select the question of the relative advantages of the offensive and the defensive, whether the best results are likely to be attained by attacking the enemy's forces, or by awaiting their attack in the first instance. This is a subject which is treated academically at great length in many books on war, and it is well for the seaman or the soldier to be acquainted with the various arguments which are disclosed to him in such discussions, as long as he realises that the decision in such matters will not rest with himself, but with those who are responsible for the policy of the country which he serves. War, as we are reminded so often nowadays, is a continuation of national policy by means other than those of the diplomatist, but, in order not to be misled by this constantly quoted definition, it is essential to bear in mind that a war is not always brought about by the policy of one's own country, but just as often by the policy of some other nation, unless it can be said that defending one's own vital interests when attacked may be called bringing about war by a 'continuation of policy.'

The naval or military authorities responsible

for drawing up strategical plans have their hands tied from the very outset; since it does not rest with them to control the policy of the country, they are not even in a position to decide the most important question whether to attack first, or to leave the initiative to the enemy. This is only one example of the influences bearing upon naval and military strategists in the exercise of their art, others must be noted in due course, but however strong such influences may be, the ideal in war will always be to put aside all side issues and concentrate attention upon the single question of the strength and distribution of the armed forces, especially those capable of movement, in the theatre of war. Immediately on passing from a state of peace to a state of war everything becomes a side issue, to which weight must be given only in so far as it influences the strength, the spirit, or the movement, of the fleets or armies. The diplomat, all-powerful in peace as the recognised exponent of the national policy, then finds his chief use in the influence he can exert upon the strength of the forces thrown into the balance on sea and land.

In studying simple strategy, the methods of handling the sea and land forces, it will be interesting to try and look upon the subject from the seaman's and soldier's point of view, and to consider some of the influences brought to bear upon them when deciding upon the strategical movements of the forces which they control.

As we have already noted, histories of wars are usually written from the point of view of the critic, rather than the man of action, whose strenuous life leaves him but little time to write out explanations of the motives and influences which led him to adopt the course of action which history records with more or less accuracy.

PEACE STRATEGY

Following this course, let us first consider the work of the strategist in time of peace. While neither the seaman nor the soldier is responsible for the national policy, both must assume full responsibility for tendering advice in regard to the amount of force required to maintain that policy, if it should bring the nation into conflict with any other Power; and not only must they form an estimate of the forces that must be provided, but also the state of readiness in which such forces must be maintained in order to deal with strategical situations which may arise.

To avoid a lengthy elaboration of the many considerations involved in the acceptance of this division of responsibility between statesmen, who deal with policy, and their professional advisers, let us take a definite example from the British Empire, which naturally is of special interest to ourselves, and let us select a recent year, but one not so recent as to involve the discussion of current politics. The year 1907 is sufficiently remote to serve our purpose, and we

can consider peace strategy as it might have appeared to seamen and soldiers respectively in that year.

As regards the navy, the duties of the sea force had been clearly defined by the Royal Commission which sat under the presidency of Lord Carnarvon in 1882. 'The Royal Navy is not maintained for the purpose of affording direct local protection to seaports or harbours, but for the object of blockading the ports of the enemy, of destroying his trade, attacking his possessions, dealing with his ships at sea, and we may add, of preventing an attack in great force against any special place.'¹ To this we may add that ships are far more dependent upon harbours in modern times than they were in the sailing days, and it may be as important to deal with an enemy's ships in harbour as with those at sea.

In order to carry out these duties, bearing in mind the wide distribution of the interests to be defended, and also of the foreign war vessels by which they might conceivably be threatened, the naval advisers of the Government must have devoted months, and probably years, to studying the question of the standard of naval strength required to maintain the national policy. It is a matter of common knowledge that the conclusion arrived at was that we required a fleet equal to the two fleets next to our own in strength, regardless of flag, with a margin for contingencies.

¹ C 5091, 1887, *Report of Colonial Conference*, Appendix.

To study the problem properly it would be necessary to examine the numbers of war vessels of all classes, but it will be sufficient for purposes of illustration to compare only the numbers of first-class battleships. Of these we had fifty-two as compared with forty-three belonging to the two next Powers. This gives some indication of relative strengths at sea, but with a view to readiness for immediate action in different parts of the world it is necessary for the peace strategist also to advise on the subject of distribution. Here it is interesting to note that the total number of foreign first-class battleships in the world in those days was ninety-eight, and although we were stronger than any two Powers in the world in general, this did not mean that our standard enabled us so to distribute our naval forces as to maintain a two-power standard, regardless of flag, in every part of the world at the same time, as the following table of distribution will show :

DISTRIBUTION OF FIRST-CLASS BATTLESHIPS IN 1907

	British.	Two next Powers.
Home waters, Baltic,		
and Atlantic. . .	45	40 (Germany and U.S.A.).
Mediterranean . . .	7	27 (France and Italy).
Pacific	14 (Japan and U.S.A.).
Total	<u>52</u>	<u>81</u>

In order to maintain a 'two-power everywhere' standard we should in those days have required eighty-one first-class battleships instead of fifty-

two. The figures also show us at a glance the importance of the Japanese alliance which was in force at the time, and the dominating influence of policy and naval force upon each other. The total number of foreign first-class battleships in the world in general increased from seventy-nine in 1904 to ninety-eight in 1907, the year we are considering, and a national policy of alliances had perforce been substituted for the old policy of 'splendid isolation,' only possible in an era of greatly predominating strength.

With regard to the system on which our battleships were distributed, we have the statement of policy published by the Admiralty in 1902, which ran as follows : ' It is the battleships chiefly which will have to be concentrated for the decisive battle, and arrangements with this object must be made during peace. The geographical positions and varied interests of the maritime Powers prevent such complete concentration in modern times as was practicable in the past. Thus Russia divides her battleships between the Baltic and the Pacific ; both Germany and France have concentrated in European waters, where also the greater part of the British battleships are massed. Our possible enemies are fully aware of the necessity of concentrating on the decisive points. They will endeavour to prevent this by threatening our detached squadrons and trade in different quarters, and thus obliging us to make further

detachments from our main fleets. All these operations will be of secondary importance, but it will be necessary that we should have sufficient power available to carry on a vigorous offensive against the hostile outlying squadrons without unduly weakening the force concentrated for the decisive battle, whether in Europe or elsewhere.'

From extracts from public documents of this nature we have been able to gather much about the peace work of the naval strategist at the period we have selected. His task was much facilitated by a definite understanding as to the duties of the navy, a definite knowledge of the strength and distribution of foreign forces which might be in conflict with the policy of the nation, and definite principles upon which to work.

The military strategist was not so fortunate. As far as can be judged from public documents, he had no definite official statement specifying the duties of the army, like that which was supplied to his naval contemporary in the document we have quoted from. Unlike the navy, the army was charged with local defence, as well as with offensive duties. It was an accepted national policy that sufficient naval force should be provided 'to prevent an attack in force against any special place.' This, of course, must have been taken to mean the prevention of such attacks across intervening seas, because no number of battleships would be of any avail against attacks over land frontiers, excepting in

so far as they could guarantee a safe passage for troops to be sent from the United Kingdom to the territory threatened. Troops would be required to meet the attack, and their strength must be calculated. The defensive problem of the greatest interest to the population of the United Kingdom, the population supplying the army with men and money, was the problem of defending the United Kingdom itself. For the military strategist to form his estimate of force required for this purpose he required information on two points, firstly, the vital interests in the United Kingdom that required to be safely guarded, and, secondly, the hostile force against which provision must be made. On the first point he could satisfy himself by consultation with naval authorities, economists, and financiers. On the second point a controversy had been raging for some years as to what number of transports carrying hostile military forces might be expected to evade our fleet, under the varying conditions of naval warfare, and as a matter of fact no rigid rule could be laid down in regard to the exact number of hostile troops that we might have to provide against. Thus the military strategist was confronted with difficulties at the outset in obtaining definite *data* upon which to base his estimate of the force required to maintain the national policy.

Passing to oversea territories under the British flag, in no case need he consider that any great

Power could bring its whole army to the attack, the amount of military force that could be used would depend upon communications, supplies, water, the friendliness of the population of the country passed through, and many other factors. All these factors could be calculated and allowed for, and the armies required for the defence of such territories could be estimated. In the case of islands, the naval situation in the local seas would give a measure of the size of hostile military forces that might be expected to attack.

These considerations must all have influenced the military strategist in 1907 when forming his estimates of the forces required for local service in war; but his task would by no means be at an end then, he would require some guidance in regard to the policy of the country, in so far as it involved the use of armies in hostile or friendly countries, or in territories in dispute. Treaty obligations would be some guide in this calculation.

In an Empire with a population including only one of European descent to every nine of other races, it was also a matter of some anxiety to the military strategist to ensure that enough armed forces were provided as a guarantee against internal disturbances.

A military authority responsible in peace time for estimating, upon these various *data*, the military forces required to maintain the national policy, would doubtless envy his naval contemporary the comparative simplicity of his

problem. We have seen that, even in that case, the problem was considered too difficult to be dealt with in detail, and was solved by the rough and ready 'two-power' estimate of necessary strength. The military man could not take the two strongest military Powers, and ask for an army equal to the two strongest armies, because under no conceivable circumstances could an army of such vast strength be required; but while it was useless to consider the total armies of prospectively hostile Powers, it was necessary to calculate the proportion of such armies that could be brought to bear against British territory, or vital interests; an estimate could then be formed of the force required to meet such armies. The strength required for use in other countries in connection with treaty obligations could also be calculated, and it is presumably upon information such as we have considered that the military strategist of 1907 based his estimates of the necessary strength of the land forces. Whatever may have been the issue of his deliberations, we know that the result was the abolition of the army corps organisation for the army, and the substitution of six divisions of all arms with a ration strength of about twenty thousand each, and a division of cavalry in addition, to form the regular field army provided from the United Kingdom,¹ besides oversea garrisons.

¹ In addition to the Special Reserve, to fourteen divisions of Territorials for home defence, and to Yeomanry.

Both on sea and land the example we have taken from our own case shows us the important and strenuous work required of the strategist in time of peace in estimating the forces required to carry out the national policy. It is equally important for him to work out hypothetical plans for using these forces, because by that means alone will he be able to calculate the time problem, and to deduce the state of readiness in which the forces must be maintained, and their peace distribution, in order to carry out such plans with any prospect of success. Hypothetical plans of this nature serve another purpose, in showing whether the available information is sufficient; if not, it is the business of the peace strategist to obtain the knowledge required.

WAR STRATEGY

The work of the peace strategist is dull. It involves many years of diligent office work, calculations of strength in men and material, of armament, stores, and supplies, and of movements by sea and land. Much of his work is apparently thrown away, since the policy of his country may never result in a war which would put to the test the hypothetical plans to which so much labour is devoted. At the same time, he is sustained by the thought that, when war does come, his patient preparations may make the difference between failure and success, and his study of history will have shown him

that there is one far more terrible ordeal for a nation than a successful war, and that is an unsuccessful one.

THE PSYCHOLOGY OF WAR

We have noted that, immediately on passing from a state of peace to a state of war, everything becomes a side issue to which weight must be given only in so far as it influences the strength, the spirit, or the movement of the fleets and armies, and before passing to the strategy of these forces we will examine some of these side issues, in order to try and estimate the extent to which they are likely to influence strategy. First and foremost let us put what perhaps we can hardly call a side issue at all, and that is the spiritual impulse that influences thousands to give up everything they hold dear, including life itself, in a great national cause. The psychology of war is a subject that would fill a book of absorbing interest, but such books have yet to be written both about war and about all the great impulses behind human effort. It is said frequently that the tendency of civilisation towards material comfort is killing the power of national spiritual impulse, and it is thought by some that wars can be abolished by propaganda which explain that even the winning nation cannot amass more riches or greater comfort for its people by such means. This point we will consider under the material, rather than the moral,

factors which influence the strategist in the conduct of war itself.

The strength of ideals and their dominance over material conditions and physical discomfort was brought home to those who had the privilege of hearing the national anthem sung by thousands of men round their bivouac fires on the South African veld on the night of Queen Victoria's birthday in 1900 ; and, going back a few years farther, it is possible to imagine the feelings of a Kitchener, standing on a rocky eminence in the Soudan desert, and looking down on his small disciplined force, standing to receive the charge of wild hordes of fanatical barbarism, surging forward in waves of tens of thousands to the attack. Then again, besides the spirit or *moral* of the forces themselves, it is equally important to consider the spirit of the nation of which they are the instruments. We saw only ten years ago men of the Japanese professional classes, who had not been chosen for the fighting forces, struggling along the deep muddy tracks behind Kuroki's army, dragging the handcarts upon which the forces at the front were obliged to rely for their daily supplies. The strategist must take account of all these things. If the right spirit may be counted upon in the nation and in the national forces, his task is comparatively easy ; he may be compared to a surf bather on the crest of a wave, whose only task consists in holding his plank straight so as

to avoid disaster to himself; even if such a disaster should happen, he knows that the wave will go on all the same; he does not create the wave, but only uses it for his purpose. As regards the spirit in the fighting forces themselves, we can quote, from the annals of a so-called savage race, one of the proverbs that inspired the disciplined regiments of Zulus. 'To go forward is to die. To go back is to die. Let us go forward.' We know how great leaders have appealed to different moral factors, according to the national characteristics of the men they commanded. Nelson appealed to duty, Napoleon to glory, but great moments in war requiring such appeals are the exception, and are led up to by years of strenuous endeavour on the part of those who are responsible for training the national forces. The spirit of the nation itself is a matter for statesmen, as far as such moral factors are under human control.

RESOURCES FOR MOVEMENT

Next in importance to the question of *moral*, we can put the question of rapid and continuous movement. There is something irresistibly attractive about movement. The mathematician explains to us, in defining 'energy' from the point of view of his science, that, while the mass of a body which is moving must be considered, its velocity contributes far more to the energy; the mass remains constant, the velocity is multiplied

by itself. A weight of 20 lbs. moving at 10 feet a second has an energy of 1000, while if it moves at ten times that velocity it has an energy, not of 10,000, but of 100,000. The strategist soon finds that the value of forces he controls depends upon his powers of moving them, upon their 'mobility,' and it is for him to consider the conditions upon which the power of movement is based. At sea, the rate of movement for large forces is between twenty and thirty times as rapid as it is for armies; in the air, movements may be five or more times as rapid as they are on the surface of the sea. The sea and air strategist must see to it that there is a supply of fuel, since his forces depend upon machinery for all power of movement; the land strategist must see to it that there is a supply of food, forage, and water, because he knows that the enthusiasm and combined effort of the thousands of souls he is employing will depend upon the mechanism of thousands of stomachs. Supplies of fuel and of food are items which the strategist can never leave out of his calculations, since without them the moral factor, which we put first in importance, can never be enduring.

The strategist who realises the dominating importance of rapid movement, and the advantage he can gain over a hostile force by superior mobility, must obviously study deeply the conditions upon which the movement of his forces depends. Napoleon's armies frequently out-

manœuvred their opponents by the simple expedient of allowing the troops in their advance to live upon the resources of the country, collected by themselves, instead of upon supplies first collected in supply columns, parks, magazines, or what not, and redistributed with all the attendant delays which are unavoidable under such a system. Keppel, whose influence led to the universal practice of coppering British ships of war, enabled Rodney to defeat Langara's Spanish fleet off Cape St. Vincent in 1780 ; if the British ships had not been coppered, the Spaniards would have escaped. Such examples from land and sea warfare illustrate the results obtainable by the strategist who considers the conditions of movement, and devises means for increasing mobility.

FINANCE AND WAR

Then also the question of finance must be considered. It is only of late years that due weight has been given to this factor in the study of war. In the words of our own Foreign Secretary, Sir Edward Grey, we have in this country a Norman Angell society which produces most attractive and forcible arguments, appealing most strongly to the intellect, on the question of the cost of armaments and of war generally. These arguments have met with some success in this country, but so far not in other countries ; even if they do, it is not enough to get things into people's

heads, you have to get them into their feelings as well before they become really operative. The schoolmaster can teach things which the lecturer cannot; the lecturer appeals to the intellect, the schoolmaster finds it necessary to enforce knowledge by appeals addressed not entirely to the intellect, but also to the feelings. The one schoolmaster who can perform this task in regard to war is finance; the pressure of finance is the one thing which will bring home to people the desirability of diminishing the probability of war, and of keeping within bounds the expenditure upon armaments; and if there is little that is hopeful at the present moment, we may be approaching the time when the pressure of finance will alter the perspective, and bring about a different point of view.

This seems to be all that there is to be said about the effect of finance upon war preparations, and upon the probability of the occurrence of wars, and it will be conceded that, at the present time, this does not affect the strategist to any appreciable extent; what does affect him, very seriously, is the effect of financial considerations upon the conduct of war itself. Wars cannot be financed entirely out of the national income, it is necessary to raise capital for the purpose, a point which is made clear by a very moderate estimate that a war between the Triple Alliance and the Triple Entente would cost the combatants nearly £9,000,000 a day,

nine times as much as the peace expenditure, which some of them find it difficult to provide for out of revenue.¹ In these circumstances, there can be no doubt about the importance of finance, side issue as we may call it, upon the strategy of sea and land forces. Human life must be freely sacrificed, in attempts to force a conclusion, by countries unable to bear the financial strain of prolonged warfare, and it is just as important for a government to know the effect of the outbreak of war upon the finances of a country, and the steps to be taken to avoid a financial collapse, as it is for the strategist to make plans for using the sea and land forces. The Russo-Japanese War showed how one influence reacted upon the other, and how successful battles affected the credit of Japan in the early stages of the conflict, and it is generally supposed that the end of that war, and the terms of peace, were brought about by the financial, rather than by the military situation.

The difficulty we are confronted with in dealing with this subject is that the present world-wide system of credit is of very modern growth; it has never been subjected to the test of a war involving the great financial Powers, and what will happen is a matter of conjecture. In a war involving only minor states, with perhaps one great Power affected, the necessary funds can be

¹ Mr. Edgar Crammond's address to Aldershot Military Society, January 1914.

provided by neutral countries, as for instance in the case of our own South African War, which was financed to a great extent by France; but if several of the great Powers were belligerent, especially England and France, which are the chief lending countries, no financial authority seems to know what will happen. Few brains can grasp the intricacies of the modern system of finance and credit, and those who can do so seem unable to devise a system of financial preparation for war which approaches in completeness the plans made by the strategist for the use of the national resources for battle.

The seaman or soldier, who is anxious to ascertain the extent to which his strategy is likely to be influenced by financial considerations, is confronted with great difficulties. 'To outsiders the money market seems a dull subject, because it is difficult to explain it in any but a dull way. Like philosophy it has a language of its own, full of unintelligible technicalities, which only become intelligible if one uses them in one's daily life.'¹ It is possible to grasp some idea of the system of credit and banking which has grown up in modern times, and to realise that credit depends upon confidence. In private and business life, land, commodities, precious stones, stocks and shares, bills of exchange, in short all forms of or rights to wealth, which have value,

¹ 'Lombard Street and War' (*The Round Table*, March 1912), from which some of the succeeding sentences are quoted.

but are not currency, and are useless for the payment of labour or the purchase of materials, can be taken to a bank, pledged to it, and the owner receives in return the bank's currency, either in notes, or, in the British Empire and the United States, in the form of the right to draw cheques. By this simple process dead wealth is turned into currency and made available for any use to which the borrower wants to put it. Without some such system the cotton grower must wait until his product had been worked up into cotton fabrics and sold to the retail buyer before he could get the money required to sow and tend the next crop, and similar examples could be quoted from every industry. This is not due to the transaction being of a risky nature, but simply because the wealth in the product in its different stages is not employable unless it can be turned into currency. There is security behind the currency in all the stages of production and manufacture, unless anything abnormal intervenes, such as over-production beyond the demand for the particular product.

Credit depends upon normal times, when business flows in normal channels, and accurate forecasts can be made. The nature and the extent of credit are based on a very great number of estimates of profitable enterprise in all parts of the world, made jointly by a great number of traders, manufacturers and others, and a great number of bankers at the credit centres of the

world, such as London, New York, Paris, and Berlin. If these estimates have been incorrectly gauged, the stability of the banks may be endangered. Their assets may be locked up in loans which cannot be realised, and their depositors may be demanding gold. Confidence, upon which credit depends, rests first on the belief in the soundness of the banking world, and, secondly, on the belief that every creditor of the bank can get gold if he is entitled to it, though no one supposes that any bank is in a position to pay all its liabilities in gold at the same time ; if it were so, there would be no such thing as credit. Still, gold is not only the indispensable foundation on which a stable banking system is built, but it is the sole means for settling the balance of indebtedness between one nation and another.

What the banker does for the private individual and the man of business, the financiers at the great centres, such as London, New York, Paris, and Berlin, appear to do for nations. They provide currency in exchange for securities, and such currency is in the form of paper of some sort. The value of securities cannot all be realised in gold simultaneously, but the whole system depends on credit, and credit, as we have seen, depends upon confidence. The holder of a paper currency, whether bank-notes, cheques, bills of exchange, or other natures, retains the impression that his particular holding can at any time be converted into gold, which has an intrinsic

value of itself. London, alone among the great financial centres, has undertaken to meet every legitimate demand in gold at all times and to any amount. London has become the banker of the world, and bills on London are the usual means of settling all forms of indebtedness between this country and the outside world, and are largely used by other countries also to settle debts as between one another.

In these circumstances, it is interesting to note the amount of the gold reserves in different national banks. The Bank of France £128,000,000 ; the Bank of Russia £125,000,000 ; the Reichsbank £55,000,000 ; the Bank of England £35,000,000.¹ The figures are rather striking in view of London's position as the only free gold market. It is considered to be certain that, if time is given, London has the power to draw all the gold she wants from other countries by raising the bank rate, so that money can be employed more profitably in London than elsewhere ; during the American crisis of 1907 the rate was raised to seven per cent., which brought gold to London from twenty-four different countries. The leading Continental authorities recognised that London's cause was their own, and they must come to the aid of London to save themselves.

These very incomplete notes will perhaps

¹ About £35,000,000 more is held as a reserve by other banks in the United Kingdom.

suffice to indicate the nature of the influence which finance may bring to bear upon the British strategist during the course of a great war. In the very able article from which we have quoted, the writer estimated that the most critical period will be the few days or weeks after the declaration of war, or the few days before that declaration, if it was quite clear that war was inevitable, and that the situation will depend upon the coolness of the British people, and the view which foreigners take of our strength. If we are defeated, a financial collapse can hardly be averted. The deduction drawn was that the British fleet is the best protector of London's gold reserve, and the same conclusion was arrived at by the late Sir Robert Giffen, and by all financial experts who have devoted attention to the subject of finance and war.

The deduction for the naval strategist is that the financial situation necessitates the distribution of the forces at his disposal in such a manner as to avoid the chance of even a minor defeat, which would shake the delicate fabric of credit, based as it is upon the confidence of others in our success; and the sooner a decisive victory can be gained at sea the better for the financial situation. But strategy teaches these lessons, independently of the question of finance, and if the strategist concentrates his attention upon the movements of the hostile forces, he is doing the best he can to deal with the financial side issues.

In this, as in all other war questions, it is important to consider the enemy's point of view as well as one's own; it is a case of the relative probability of financial collapse, as compared with one's opponents.

In a subsequent chapter, dealing with war plans, we shall consider the question of mobilising—rendering mobile and ready for battle—the naval and military forces at the disposal of the strategist. It is only by accelerating this process that it is possible either to make the first strategic moves, and so obtain the initiative, or to prevent the maximum effect being produced by the enemy's forces which move before our own. We have noted the effect of even minor defeats in the early stages of the war upon credit, and upon the financial situation, and here we must take note of the question of war chests. These are reserves of gold maintained under Government control to provide for the immediate needs of the army and navy, especially in connection with mobilisation. It has been advanced that without some such provision the process of mobilisation might be seriously delayed, and we have noted the effect of any loss of time at a period so very critical to the strategist. At the outbreak of the Franco-Prussian War in 1870, Prussia possessed a war chest of £4,500,000, and Bismarck is credited with a statement that, but for this, she would not have been able to gain the two days' start which prevented the invasion of the whole

right bank of the Rhine, and was perhaps the chief factor in determining the whole issue of the war. Account must be taken of this point, which is one for Governments rather than for the seaman or the soldier, but it is within the province of the latter to advance that, if the want of a war chest would lead to delay in naval and military mobilisation, then financial provision may be more than a side issue in sea or land strategy, it may be a dominating factor.

We have so far dealt only with the initial stages of a great conflict, and not with the question of financial endurance. As a rough guide for studying the relative question of endurance we can note an estimate made recently that in the event of a general war in Europe the average daily expenditure on the war would amount to the following sums: Great Britain, £800,000; France, £1,800,000; Russia, £2,250,000; Germany, £2,200,000; Austria-Hungary, £1,000,000;¹ Italy, £750,000. The deduction for the strategist is that, having got over the initial crisis, the British strategists could afford to defer the final issue better than those of any other country. The total cost of a war depends, of course, upon its duration. Of wars that have occurred since the modern international financial system has been in operation it has been estimated that, in direct expenditure, the South

¹ Mr. Edgar Crammond's address to Aldershot Military Society, January 1914.

African War, which lasted thirty-one months, cost £211,000,000. The Russo-Japanese War cost Japan about £203,000,000 in nineteen months. The Balkan wars cost £246,000,000 in thirty-four weeks.

We need not elaborate further our notes on finance from the point of view of the strategist. The point seems to be clear that for the huge sums required recourse must be had to other countries, and the prospects of raising foreign loans depend upon the opinions formed in regard to prospects of success in battle, which will again depend upon the strength and the spirit of the forces handled by the strategist, and his skill in their disposal.

THE INFLUENCE OF THE PEOPLE ON WAR STRATEGY

In the year 1891 occurred the war in Chile, when a hastily raised Congressionalist army under Del Canto captured Valparaiso, and secured the control of the whole country. The strength of that army amounted to only about 9,500 men, and the Balmacedist regular troops opposed to them numbered 32,500. On several occasions the Congressionalists met hostile armies stronger than their own in the open field; even after successful battles they appeared to be in desperate straits, but in the end they attained their object. The campaign afforded many lessons of use to the strategist, but the most important was con-

tained in Del Canto's official explanation of the success of his little army: he attributed the issue to the fact that the cause was national, and the national feeling communicated to his force the moral energy that carried them 'over the stream of the Aconcagua, and up the heights of Concon and Placilla.'¹

The value of the driving power of national spirit and approval behind the forces wielded by the strategist is incalculable, but this moral factor we dealt with under the heading of the psychology of war. We must now devote attention to the more material factors affecting the well-being of the population, since the strategist, who wants a free hand in the conduct of his art, will find that he is hampered constantly by influences brought to bear upon him, through the Government he serves, if he does not devote attention to such factors and foresee their effect. Fleets and armies are instruments of the national policy, and, as such, the nation is inclined to claim a word in their disposition; wars being brought about by a conflict between national wills, it is of importance to the strategist to consider what are the national vitals on each side, in order that he may be in a position to threaten those of the enemy, while safeguarding those of his own nation. Putting aside for the moment all the complications attending the study of economics, it will be conceded that the most vital

¹ For details see *Letters on Amphibious Wars*.

interest of the people in general is to be fed. In times of crisis, if all the complicated economic fabric built up by years of high civilisation is swept away by a great catastrophe, such as war or tumult, we arrive at the problem of how the hungry and the food for which they crave can be brought together. At such times gold weighs as nothing in the balance compared with bread-stuffs.

The original conception of the best method to bend the will of another nation or tribe was the method of slaughter, pillage, and enslavement; this is no longer in vogue excepting amongst savage races, but while savage butchery of men, women, and children is now denied to civilised nations, the more lingering method of starvation is retained, where it can be applied with any prospect of success. Fortunately for the non-combatant population, it is only in the case of a beleaguered town that the full effect can be produced; in such a case the besieger does not hesitate to cut off all supplies of food, and even of water, if he can get at its source of supply, and he then waits for starvation, disease, and thirst to force the inhabitants and garrison to surrender. If a close investment can be maintained it is only a question of time; the defenders must give in sooner or later.

Let us consider how far pressure can be brought to bear upon a whole nation with the same object in view. Much will depend upon the nature and

distribution of the population, and the methods by which they earn their livelihood. The ideal for the strategist is to have behind him an agricultural population, drawing all their means of sustenance from the soil. It is very difficult to bring pressure to bear upon such a people by the exercise of any external influence; the nearest approach to such a condition which we can find in modern wars was exemplified in South Africa in the year 1899 to 1903, but this would be a very misleading precedent for the strategist in considering the conditions affecting the populations of most naval and military powers. The resources of modern civilisation have made it possible for the population of each country to increase far beyond the number which can live upon the resources of the soil in their immediate vicinity. Owing to the development of industries, the tendency has been for the people to crowd densely together at the industrial centres, and in such circumstances their means of livelihood depend entirely upon the communications which carry the raw materials to the factories, the finished products to their markets, and, most important of all in a grave emergency, the supply of food from the producer to the consumer. The whole fabric depends upon cheap and easy communications, and it will be seen at once that any interruption of the constant flow of food and merchandise along these communications will produce acute distress amongst the popula-

tion dependent upon them for existence. The time required before the result is acutely felt will depend in the first instance upon the reserves of food and other requirements which are ready distributed, and so readily available.

The strategist must, therefore, study both the internal communications of his own country, and also the external communications with other countries. Communications carrying food will be of the most vital account, but those carrying raw materials and the manufactured products will also be of great importance, because of their effect upon employment, which provides the industrial population with the means of purchasing their food and other requirements.

Taking internal communications first, the strategist must see to it that his plans interfere as little as possible with the communications that are so vital to the population. Great foresight is essential to ensure this result; the civilian authorities must be taken into his confidence to the extent necessary, and of this we have had a recent and striking example in the relationship between the military and municipal authorities in Paris. It was made clear to those responsible for the well-being of the population of the French capital that, owing to the movements of troops, all the railway communications with Paris would be required for military purposes during the period of mobilisation and concentration of the army. After taking account of the reserves of

food in the city, the municipal authorities found that such interference with communications might cause acute distress amongst the people; they therefore took steps to accumulate a sufficient reserve of food to tide over the critical period, and ensure that there will be no question of starvation. The mind of the military strategist has thereby been cleared of all anxiety upon this important point, and it is clear that a great advance has been made towards avoiding the hindrances and delays which would have occurred on mobilisation if foresight had not been exercised. Besides the question of internal communications, another point which deserves attention is the question of the depletion of food-stocks usually available for the population, if the Government should make large purchases for the fighting forces on the outbreak of war. The only method of avoiding this danger in all countries is for the Government at all times to maintain at the mobilisation centres sufficient reserves to tide over the period of mobilisation and concentration. The amount that can be stored depends upon the stocks that can be accumulated without deterioration, and upon the 'turn-over' that can be provided by consumption in time of peace. As a counsel of perfection, it is most desirable that the system of maintaining reserves of food should be applied, not only to the fighting services, but to all those employed by the Government, and by public and private associations that are

employers of labour on terms including the provision of food or rations. Furthermore, even if such reserves were maintained, the population would still be dependent to a great extent upon communications for distribution, and this difficulty could only be avoided if every household maintained a reserve of some sort. This ideal is probably unattainable in case of the poorer people who live from hand to mouth in the crowded industrial centres, and the problem varies widely in different parts of each country. Much depends upon the nature of the food consumed, upon facilities for storing reserves, and upon dependence on bakers and others for preparing the staple food for consumption. At one end of the scale, in our own country, we can put the population of some remote parts of Scotland, where large reserves of oatmeal are maintained by every household; at the other end we can put all who are dependent upon the baker for their daily supply of bread. As the result of improvements in means of communication, the latter class nowadays includes the majority of the population even of agricultural districts, where bread is no longer baked in the home as it was a few years ago.

From all this we can deduce that, in an average country, considerable pressure can in these days be brought to bear upon a hostile population by interference with the means of communication, especially those of large industrial centres; the

strategist can be free to a great extent from anxiety on this point if foresight has been exercised, and reserves of requirements are kept in stock, but such reserves can only suffice for a short period, and we get back to the same conclusion to which the consideration of other side issues has led us, that in war strategy the one consideration of first importance is to defeat the mobile forces of the enemy. The enemy's troops are the only instrument he can employ to interfere with the internal communications of the country, and, if these troops are defeated, the communications are safe, and the population can live under normal conditions in this respect.

EXTERNAL COMMUNICATIONS AND SEA POWER

While the internal communications used by the population affect the soldier, the defence or attack of external communications is mainly the business of the seaman. Even with continental countries this holds good, although nearly all of them have more than one land neighbour, and in time of war communications by land with the outside world can be kept up across neutral or friendly territory. In these circumstances the land communications with other countries, excepting those between the belligerents, do not seriously affect the plans of the soldier strategist. Belligerents on land cannot employ their forces in the territory of powerful neutral nations.

Unlike the land, the sea is under no national

flag, and affords a common battle area to which the forces of all countries have access. Sea transport affords a simple and cheap means of communication with all parts of the world, and the population of every country is dependent to a greater or less extent upon such traffic. Under these conditions the maintenance of sea communication for the population of a country like the United Kingdom can hardly be classed as a side issue by the strategist; it is the principal object to be kept in view. The extent to which the people depend upon the sea for their livelihood appears to be realised in this case, although there has never been an exhaustive enquiry into the subject by any authoritative body; food and raw materials were dealt with a few years ago by a Royal Commission, but not the question of the export of manufactures, upon which the population depends for employment, and there are no complete statistics to show the proportion of the manufactures which are sold in the home markets. It is not even possible to ascertain with any degree of accuracy the total amount of foodstuffs available in the country, but enough is known to prove that there would be acute distress in a very short time if the cost of sea transport rose very materially.

It would be impossible to blockade closely the whole of the coasts of the British islands, but the cost of sea transport depends upon the rates charged for insurance of ships and cargoes against

war risks, and the whole economic system, upon which life in this country rests, depends therefore upon the underwriters who settle the war premiums, and therefore the cost of transport. Not being fully acquainted with the naval situation, and having but little experience of naval war on a world-wide scale as a guide, they will naturally be liable to be influenced by reports of early actions at sea, and even a very minor and unimportant want of success is likely to influence them out of all proportion to its real effect from the point of view of the strategist.

In considering this branch of our subject, therefore, we again find, as we did under the heading of finance, that the sea strategist, in making his plans, must be careful to avoid even the appearance of failure at the outset, and the sooner he can bring about decisive success against the enemy's sea forces the better. It is doubtless correct to predict, as most writers on naval strategy have done, that the issue will ultimately be decided by great battles at sea; but even after complete success in such battles the work of the seaman is not at an end, he must still devise means to protect the sea traffic against sporadic attacks. To take an example from history, in the words of Admiral Mahan, 'thus it was that Napoleon, to some extent before Trafalgar, but afterwards with set and exclusive purpose, used the French Navy, which he was continually augmenting, and yet never, to the

end of his reign, permitted again to undertake any serious expedition. The mere maintenance of several formidable detachments, in apparent readiness, from the Scheldt round to Toulon, presented to the British so many possibilities of mischief that they were compelled to keep constantly before each of the French ports a force superior to that within, entailing an expense and an anxiety by which the Emperor proposed to exhaust their endurance.' ¹

But again, both in the strategy preceding and following decisive battles at sea, we must remind ourselves that all questions in war must be studied from the relative point of view. If we are entirely dependent upon cheap sea transport, every naval Power is partly so, and if they can interfere with our sea traffic, we can also interfere with theirs, and such action would sooner or later affect their people, though the effect would be slower than in our own case.

Here the strategist is thrown back, as he is after considering all of what we have called side issues, upon the fact that he cannot be far wrong if he confines his attention to the destruction or capture of every form of fighting craft, on or below the surface of the sea, or in the air above it, which the enemy can employ to interfere with or to control sea communication.

The points that we have noted in regard to the influence of the population upon strategy have

¹ *Lessons from the War with Spain*, p. 84.

shown us that, if those responsible for handling fleets and armies are to have a free hand in opposing the forces of the enemy, it is essential that there shall be foresight and elaborate organisation to provide for the well-being of the nation which uses such fleets and armies as instruments of policy. Such a result requires the combined action of all the great departments of the State, and neither seaman nor soldier is in a position to co-ordinate their work ; it must be done by the statesman.

In succeeding chapters we shall devote our attention to the study of strategy pure and simple, assuming that the work of the statesman is so efficiently performed that the strategist has a free hand to dispose his forces to the best effect, so as to defeat the forces of an opponent.

CHAPTER II

ON PREPARATIONS AND WAR PLANS

Value of history—Mobilisation—Ships in commission—Information—Land strategy—Sea strategy—Plans of campaign—Offensive on land—Defensive on land—At sea—The initiative—Control of movements—Theatres of war—Obstacles on land—Land communications—Time problems.

RECOGNITION of essentials, and concentration of attention upon them, we know to be the secrets of success in all human enterprises. In regard to land warfare, Napoleon is reported to have said to the Austrian generals at Leoben: 'There are many good generals in Europe, but they see too many things at a time. . . . I see nothing but the enemy's masses, and I endeavour to destroy them, certain that all the accessories will fall by themselves,' and in this explanation of land strategy he was only stating in different words the principle that Nelson and other great naval authorities before and after his time have expressed in well-known sentences about warfare at sea.

We noted the difficulties which confront the practical strategist who seeks guidance from history when making his plans, but at the same time we cannot ignore the importance of the lessons he can learn if he has the rather uncommon faculty of imagination, of picturing to

himself the actual conditions dealt with by strategists in past wars, the influences which were brought to bear upon them, the information at their disposal at all stages of the campaign, the weather conditions with which they contended, and, above all, the moral factors which influenced their forces. Seamen and soldiers of eminence in their profession generally explain that their method of studying the history of past wars is to read with a notebook at hand, in which to record the lessons learned, and that they apply these lessons to present-day problems which they themselves may be called upon to solve. They follow on chart or map¹ the movements which took place, and at each important stage of the operations they stop their reading, in order to ponder over the situation, and to decide what they themselves would have done when confronted with a similar situation. Following a similar system, we will try to place ourselves in the position of a responsible strategist dealing with a present-day war problem affecting movements by sea, by land, or on both elements.

History—and common sense—teach us that our attention must be concentrated upon the best method to employ the forces at our disposal to defeat the forces that the enemy can bring into the theatre of war; and modern history, carefully studied, may have thrown light beforehand,

¹ Here they often find a difficulty in obtaining a map showing the country as it was when the operation took place.

and in good time, upon where that theatre of war is likely to be. If on land, we should be able to calculate with some degree of accuracy the maximum strength of the armies which our enemy can employ in that area. If at sea, we must consider the possibility of operations of greater or less importance in all parts of the world. Let us first take the points that must apply whatever the strategy may be, mobilisation and information.

MOBILISATION

It is clear that, whether our plan is to attack at once, or to await the enemy's attack in the first instance, the sooner our forces are ready to move the better. Mobilisation is the process that must be applied to forces to enable them to move, fully equipped in all respects for fighting; the term was used for armies before it was used for fleets, so let us consider the mobilisation of land forces first. The various units of which an army is composed are not kept on a war footing, either as regards men, animals, or transport, in time of peace. The men actually with the units are those undergoing training, and on mobilisation the ranks are filled up with reservists who have completed that training, and are supporting themselves in civil life. These reservists must be collected, and furnished with uniforms and equipment. Animals and transport required to complete the army must also

be collected, organised, and issued. Every hour saved in this process is of importance, and this, like all questions of strategy when looked on from the time point of view, is a relative question; if the process takes five days an advantage is gained over an enemy who takes six, but an enemy who takes four can seize the initiative against us. There can be no slackening of effort in devising expedients to improve the speed of the process, and work of this nature done in peace time makes all the difference to the plans of the strategist. We must in any case know definitely to an hour the time that we must allow before we can expect to move the units of our force; we must also know the time required before the first reinforcements, depôts of supplies, ammunition, and equipment, will be ready to perform their proper functions of replenishment.

At sea, matters are somewhat different. Movements are so rapid that no country can afford to allow several days for mobilising the whole fleet at the outset of a war, so a considerable proportion of the naval forces, varying according to circumstances, is kept by all naval Powers in a state of readiness to go into action at a moment's notice. When war appears to be imminent, the proportion of vessels in full commission can be gradually increased if the naval personnel is sufficient to provide the crews, without taking the fully trained men required on mobilisation; in the naval war conducted on the

largest scale under modern conditions, the Russo-Japanese conflict in the Far East, we can note that Japan had practically the whole of her effective fleet in full commission some considerable time before she began active operations; this was essential, because the ships of her opponent in the neighbouring seas were also in full commission. For vessels not in full commission the process of mobilisation is similar to that for a military unit; it includes completion of personnel, and, if necessary, of such supplies and ammunition as may be required. In this connection we must note the extreme complication of modern men-of-war. Although the numbers of the crews may be completed, the men take some time to find their way about rapidly, and to handle with confidence the complicated appliances in their charge. The crew of a newly mobilised ship cannot compare in cohesion and fighting efficiency with the crew of a ship that has been for some time in commission, and the strategist must bear this point in mind when deciding the uses to which he proposes to put such vessels.

The naval strategist, like his contemporary on land, must know exactly the number of hours required to mobilise his forces which require to undergo that process, but, unlike the military strategist, he knows that a large proportion of his force is ready for instant employment if occasion demands.

INFORMATION

Strategy being an art in which the human element is an important factor, it is of much interest to us to know the character and personality of our opponent, and the amount of freedom which the national system of government and organisation for conducting a war will allow to him in the conduct of the operations; this is the first point upon which information, gathered in time of peace, should be readily available. Without paying attention to the human factor in the game, it is impossible to produce the most effective results with the resources at our disposal; movements which would produce one result upon some opposing leaders, would produce quite different results upon others of different character, and it is to points like this that the greatest exponents of the art of war have devoted their particular attention.¹ The most successful leaders are those who can see into the brains of their opponents and predict with confidence the strategical plans which they will adopt; the faculty required may be called intuition, for want of a better name, but such intuition does not grow of itself; it is based upon careful study of an enemy's character, and of all the influences to which he

¹ In this connection the method by which Napoleon, in January 1814, separated Blücher's army, based on Mannheim and Mayence, from Schwartzberg's army, based on Basle, is worthy of study. See chapter v.

is subjected; it requires also the power of imagination, and of looking upon things from the point of view of another. It also requires an intimate knowledge of all movements in the theatre of war, and the value of this knowledge, and the uses to which it can be put, depends above all things upon the time when it is received.

Apart from the improved facilities for moving the forces themselves, perhaps the most important change which the resources of modern civilisation have brought about in the art of war is that due to the facilities for passing information about the world. A message that used to take months to reach its destination now takes a corresponding number of minutes. Newsagents, who record every occurrence of interest to the community, are distributed over all the countries of the world, and their resources for telegraphing to any destination are almost unlimited. The Prussian armies in their wars of 1866 and 1870 obtained from London most vital information regarding the movements of hostile armies in their immediate neighbourhood, and at the present day there is no reason why armies in Europe should not hear about each other's movements from New York, or even from Hong Kong.

The strategist who makes the best use of these modern resources will obviously have his adversary at a disadvantage, and years of strenuous

effort in calling every possible organisation to his aid will be well repaid when the time comes to put his plans to the test. The system adopted by the Japanese in 1904 affords an object-lesson in this respect; their strategists are credited with immediate knowledge not only of every occurrence in the actual theatre of war, but of the movement of every ship and every regiment bound for the Far East, as soon as, or even before, such movements were initiated, and not only did they succeed in this, but also, to a surprising extent, in concealing the movements of their own forces.

To telegraph cables, wireless stations, news agencies, press reports, and intelligence agents, we must now add observers in aircraft, to which subject we must devote a special chapter; instead of having to fight for information by breaking through the screen with which strategists on sea and land conceal the masses they are handling, it may be possible nowadays to lift what has been called 'the fog of war,' and to have full information regarding the movements of hostile forces, without expending our own fighting forces in obtaining it. Everything will depend upon the measures taken to make full use of the available facilities, and the strategist who has exercised the most foresight in this respect will have as great an advantage over his opponent as a man who can see has in a combat with a man who is blind. Whilst every possible

step must be taken to obtain early information of an enemy's movements and intentions, it is equally important, and probably more difficult, to conceal one's own. In these days this can only be done by the hearty and patriotic co-operation of the press, and of news agencies, otherwise censorship, secrecy, and even purposeful prevarication, are not likely to achieve the object in view.

Having made certain of the rapid mobilisation of one's own forces, and of the earliest possible news of the movement of one's opponent, the next point to consider is the extent to which the art of strategy in general will help us in ordering movements.

LAND STRATEGY

As regards the branch of the art practised on land, the tendency of modern writers on the subject has been dominated to a great extent by the problem presented by the situation in western Europe, where rapid mobilisation, and rapid deployment of immense and unwieldy masses, take the place of the more subtle art applied to forces that can manœuvre more freely. As, however, there are other possible theatres of war in the world, the time has not yet come when it would be safe to ignore the lessons taught by past experience in handling more mobile forces to gain an advantage, and bring about success in battle. We shall therefore devote attention to these methods in succeeding chapters, quoting

examples from time to time from past wars ; the difficulty in applying such examples lies in the danger of taking too limited a view, and of leaving out some important factor which led to success. For instance, from the victory of the Prussians over the Austrians in 1866 we might deduce that it is an advantage to divide one's army, and advance upon an enemy from widely separated bases ; whereas a much sounder deduction from that campaign is that troops armed with breechloaders have such an advantage in action over those armed with muzzleloaders that it would be unwise to base any strategical principles upon a war fought under such conditions.

SEA STRATEGY

The art of the land strategist has been formulated by innumerable writers, and certain 'principles' have been established as guides which it would be risky to ignore without good reason. The sea strategist, on the other hand, has not the same continuous and progressive experience of war history upon which to base his art ; the superiority of the British fleet was unchallenged for a whole century, and it is only of late years, since the writings of Admiral Mahan produced their influence in the world, that so many powerful fleets of different nationalities have been put upon the seas. The principal naval conflict under modern conditions occurred ten years ago in the Far East ; the operations

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in that war were confined to a comparatively small area, and afford no very complete guide to what will happen in a war in which the British Empire may be engaged, and during the last ten years war vessels of all natures, aircraft, and wireless telegraphy have developed to an extent that may alter materially the lessons that were learned on that occasion.

As regards the great naval wars of the sailing days, it is probable that the dearth of treatise written from the strategical point of view is due in a great measure to the uncertainty of the element upon which the war vessels of those days depended for their motive power. It is true that the strategic movement of armies in the days of bad roads depended to some extent upon the weather, and we have the example of the Anglo-Belgian force from Quatre Bras marching to Waterloo along a dry road, followed at a day's interval by the French army plodding through mud, but even this cannot be compared with the conditions of movement by sea in those days. Nelson, for instance, once had to struggle against head winds in chase of Villeneuve who was running before a favourable breeze; under such conditions no strategical calculations could be based upon the relationship between time and space, which is one of the dominating factors in the art of strategy.

PLANS OF CAMPAIGN

Whatever opinion may be formed upon the value of the *data* which the historian places at the disposal of the strategist, we can be certain that, when forming our own plan of campaign, we shall find no exact historical parallel to follow. We must make our own plans to deal with the conditions with which we are confronted.

In handling armies, the first decision required is whether to act upon the offensive or upon the defensive in the first instance, bearing in mind that these terms are misleading if they convey the impression that the strategy of one side is invariably to strike, and the other side to parry. Both sides must aim at a decisive offensive stroke, and each combatant takes such defensive measures as may be necessary while he is preparing to strike. It will be conceded that, in military strategy, one or other of the armies employed must move into the territory of the enemy, or into some territory, not the property of either side, which is the subject of dispute, like Corea and Manchuria in the Russo-Japanese war; such action, for want of a better definition, we may call acting on the offensive in military strategy. The question is decided by the statesman rather than by the soldier, but the military strategist who wishes his views to carry weight must be acquainted with the advantages and the disadvantages claimed for each method of opening

a campaign. He must also be in a position to tell whoever does settle the question whether the army can be mobilised quickly enough to cross the frontier before the hostile army can do so ; the arrested offensive, which involves complicated changes of plan, involves disasters such as those with which the French were confronted in 1870 by a miscalculation of the relative time problem.

THE OFFENSIVE ON LAND

The advantages of the offensive in land warfare are dealt with comprehensively in most works on military strategy. They are well summarised by Von der Goltz,¹ who reminds us that the strategical offensive originates in the political aspiration after some positive object, and that rapidity of movement and surprise are its life and soul. Before going into detail, he quotes from Willisen's *Higher Theory of War* a statement in tabular form which points out the usual results which may be expected from taking the offensive strategically. If this course is adopted, and the enemy's army is attacked, then victory may be expected to lead to the annihilation of the enemy and conquest of his country, while defeat will only mean a temporary abandonment of the project in hand. If, on the other hand, we leave it to the enemy to attack the army which we have placed in his territory, then a victory over him will produce a favourable

¹ *On the Conduct of War.*

situation, but such a victory will be fruitless, unless the enemy's fighting power is seriously impaired. If, in such circumstances, our army is defeated in battle, disaster will be averted by our favourable strategical position.

In favour of the strategical offensive, we must first note the moral factors which are all-important in war. The offensive confers the feeling that forward movement is necessary and natural, and it is impossible to exaggerate the importance of such a feeling upon the bearing of leaders and the behaviour of troops. The attacker has a clear object in view, to seek out and beat the enemy's army. Such an object is simple, and easily understood; mistakes can only be made in choosing the right way to its attainment. The forward marches, skilfully arranged, facilitate concentration of force, and this is made easier by the fact that the common objective is obvious to all subordinate leaders, while to those on the defensive all is uncertain until the enemy appears in front of their position.¹ Even if we grant to the defender the faculty of intuition in predicting the probable point of attack, an assailant who can move rapidly, and conceal his movements, has some right to expect that he will find his opponent unprepared to receive him. Mistakes in distribution of the defender's army will be difficult to rectify, because of the greater distances

¹ Here we must note that the influence of aircraft will be to reduce this uncertainty.

to be covered ; and he cannot move his troops like chessmen, in spite of the occasional assumption to this effect by critical historians.

Another point, and a very important one, in favour of the strategical offensive, is the fact that it always leads the army into fresh country. To realise the refreshing effect of change of locality in war, it is only necessary to serve in a campaign, to spend part of one's time at a post on the line of communication, and then to join the field army at the front.

Such, then, are the principal advantages claimed for the strategical offensive on land. In conjunction with the statesman, the military strategist must also consider the effect it will have upon the attitude of other nations, and the forces which such nations may throw into the balance. This is a question of policy, in which the soldier has no executive power, but it will sometimes be open to him to point out that the offensive may ensure initial successes, and the effect upon wavering countries of such successes must be studied ; as a rule it will be favourable.

We must here note from the recent wars in the near East a striking example of the influence of a neighbouring state (Roumania) upon the ultimate issue of a war in which Bulgaria successfully adopted offensive strategy in the early stages. We must also note that an assailant may even be in danger of losing allies, who are willing to assist up to a certain point, but have

no wish to see him grow too strong, and of this again we can find examples in the recent experiences of Bulgaria.

Before leaving the question of the strategical offensive, we must take note of one very important limitation, which does not always attract the attention that it deserves, and that is the effect upon the striking force at the front, the force that fights the decisive battles, of the distance that has to be covered before attaining its object. The farther that an army marches into an enemy's country the weaker it becomes, because of the detachments required along the line of advance, and the constant wastage from other causes. The foremost body of troops of an army amounts, for these reasons, to a comparatively small fraction of the total fighting strength employed.¹ Napoleon arrived at Moscow in 1812 with 95,000 men out of 442,000 that crossed the Niemen three months before. A more striking example was that of Massena, who could only bring 45,000 against Wellington at Torres Vedras out of 400,000 French who originally crossed the Pyrenees. Similar cases are those of Diebitsch at Adrianople, with 20,000 out of the 160,000 which Russia put into the field in 1829; of the Russians arriving near Constantinople with barely 100,000, with a fighting strength of about 43,000, out of the 460,000 that crossed the Danube in 1878; and of the Prussians reaching

¹ Von der Goltz, *The Conduct of War*.

Paris with 171,000 out of the 372,000 that crossed the frontier six weeks before. The 'ever diminishing power of the strategical offensive' is an unavoidable drawback that cannot be ignored in military strategy; the wastage will depend in a great measure upon the training and discipline of the troops employed, and the possession of numerous and good troops is an essential condition.

Here we may note two policies for reinforcing the army at the front, one is to send up fresh units, and the other is constantly to fill up the ranks of the units. In the Manchurian War of 1904-5 the Russians adopted the former policy, the Japanese the latter; the Japanese policy was the more effective, and Kuropatkin in his work on the war deplored the Russian system.

THE DEFENSIVE ON LAND

Turning now to the strategical defensive. Quoting from Willisen, Von der Goltz points out that if this attitude is assumed, and if the defending army awaits the enemy's attack, then victory will achieve no decisive result, while defeat may mean annihilation, and loss of the country. If the defenders attack the invading army, victory on the battlefield will produce no decisive effect upon the campaign as a whole, defeat will necessitate retreat with the object of attacking again. No special theoretical advantages are claimed for the strategical defensive, but

it allows the final decision to be deferred, and affords the weaker side more hope of favourable chances, while the factors which constantly tend to weaken the invader have time to operate.

It is all-important in this connection not to picture the strategical defensive to oneself as a simple passive state; absolute inactivity can never lead to success. The most effective method of conducting the defensive is to let the assailant develop his plan, ascertain his weak points, make use of this knowledge and attack him with concentrated forces. The defender is, or should be, in a better position to use the resources and communications, especially the railways of the country, than his assailant, and in some cases fortresses, rightly used, may give him great assistance. The sympathies of the civil population, if they can be counted upon, will be a great help to the defenders, more especially by the information they can furnish of the enemy's movements.

Against these possible material advantages we must put the moral factors, which are all in favour of the assailant. Defence produces a feeling of weakness and uncertainty, while waiting to see what the enemy is going to do; remaining at the halt in a state of constant expectancy is very trying, and, if the assailant ultimately appears at several points simultaneously, the defenders most directly affected usually clamour for reinforcement, on

the assumption that they themselves are at the decisive point.

These are the arguments which writers put before the military strategist who is considering his plan of campaign, and they may be of some use to him when the Government decides whether this plan is to be offensive, in the sense that it shall involve moving at once across the frontier of the enemy's country, or of other territory in dispute.

THE OFFENSIVE AND DEFENSIVE AT SEA

At sea it is more difficult to draw any line between offensive and defensive strategy, because it is not a question of crossing a frontier. The sea is under no national flag, and all war vessels that put to sea may be said to be on the offensive, from the strategical point of view. In the old days it was possible to 'blockade' hostile ships in the harbours which sheltered them, and the usual method was to station stronger forces in some position to intercept such vessels as soon as they put to sea, or as soon afterwards as possible. This system might be said to constitute offensive naval strategy, and we refer to it elsewhere, but we must note here that it requires a great preponderance of sea-going vessels, and also that, by adopting such a policy nowadays, we expose them to great risks from the torpedo craft, submarines, mine-layers, and aircraft which may be expected to swarm in the neighbourhood of an enemy's coast.

On the whole, the practical strategist gets little help from the theorists who attempt to classify the relative advantages and disadvantages of offensive and defensive strategy at sea. In making our plans we must consider what we must defend, namely the merchant ships upon which the population depend, our own vessels carrying troops, and also our territory against attacks on a large scale. The best, and the only way to carry out these objects satisfactorily is, firstly, to locate, and, secondly, to capture or destroy all the forces which an enemy can employ upon or below the surface of the sea, or in the sky above it. But the same condition will apply to our enemies, as against us, and both sides may be said to be acting on the offensive as far as their available resources will permit. One side or the other will commit the first act of war, and it is for the good strategist to ensure that such action is well-timed, and that it takes the form of a heavy blow at the enemy's resources. The Japanese began their naval campaign in this way, in February 1904, by attacking all the Russian war vessels that were exposed to such attacks. The main Russian fleet was in an open anchorage outside the harbour of Port Arthur.

In dealing with military strategy, we took account of the diminishing strength of an army, as it moves farther from its original base. We must note that the same condition applies, though in less degree, to sea strategy. The strength of

a fleet operating against another fleet on an enemy's coast 2000 miles away must be greater than it need be if the enemy's coast is 200 miles away, for reasons which we refer to elsewhere.¹ The effect of distance on the force employed can be reduced to a great extent if well equipped and defended naval bases have been established in the neighbourhood of the enemy's coast, but if such bases are not well defended and garrisoned at all times, they may be in the hands of the enemy before they can be utilised.

ADVANTAGES OF THE INITIATIVE

It will be seen from the foregoing notes that certain advantages are attached, both on land and on sea, to a plan of campaign which involves taking the initiative, crossing the frontier first in land warfare, or committing the first act of war in sea warfare; it is as well for us to be acquainted with these advantages, although we know that the decision in such matters does not rest with the naval and military authorities but with the Government of the day. For the initiative to be possible, we must know the state of readiness in which our own and the enemy's forces are maintained, and we must also know their exact position, as far as modern resources for obtaining and reporting intelligence will enable us to do so. These preliminaries being settled, it may be possible by the exercise of

¹ See chapter vii. pp. 186-7.

intuition to predict where and when the first decisive action is likely to take place, and this will be easier to foretell in land than in sea warfare. Beyond this point it would be unwise to draw up any detailed or definite plan of campaign ; all future movements must depend upon the results of such an action, which cannot be foretold.

CONTROL OF THE FORCES EMPLOYED

To the general control of the forces employed by the strategist we have not yet referred. We noted that the policy of countries must necessarily be controlled by their governments, and that strategy, from the naval and military point of view, must be subservient to policy ; there remains the question of a central authority to order the strategical movements, in accordance with the plan of campaign. When it is purely a question of the sea, the ideal is that the experts in such warfare—the naval authorities—shall be left a free hand in this respect : similarly, in purely land warfare, the military authorities. Examples of the success of such a system are afforded by Barham's handling of the British fleets before Trafalgar, and Von Moltke's handling of the German armies before Sedan. Aircraft, in their present stage of development, cannot be looked upon as an independent arm, and their operations must be under the direction of the naval or military authorities, according to which service they are assisting.

So far, the ideal to be worked for in deciding upon an organisation for controlling movements is a simple one. If left to the authorities concerned, there should be no delays, and any organisation which leads to such delays is a severe handicap to the strategist. Time is all-important, and all the good work he may have done to ensure rapidity of movement will be thrown away if there is any delay for consultation or sanction before starting such movements; an enemy who moves first may obtain a strategical advantage, even if he moves more slowly.

It is not an easy matter to devise a system for controlling the movements, not of fleets alone, nor of armies alone, but of the two combined. A fleet and an army, working without some such expert control, may be compared to two human arms striking and parrying independently, without being directed by eye and brain. In the art which we may call 'amphibious' strategy, concentration of purpose is required to ensure that efforts on sea and land shall be considered in their relationship to the whole plan; central control over both services may present difficulties, but the Japanese, in their recent wars against China and Russia, have shown it to be possible to devise a satisfactory system. Experience against China in 1894 showed them the importance of the subject, and ten years afterwards they had developed an organisation which worked smoothly and efficiently. Fleet and army each operated

in their turn; every movement, and every battle, produced the maximum effect that could be expected from the resources available, and whenever one service met with a temporary check the operations of the other service were immediately delayed in order that the blows should be properly timed, although the ultimate decision might be postponed.

In considering such an organisation, it is not easy to design a system which will give the control of the movements on land and sea entirely to experts. It may be possible in sea warfare to give seamen such control, and in land warfare to give it to soldiers, but the records which history affords do not tend to support any proposal to give seamen the strategical control of armies, or soldiers the control of fleets.¹ A recent example of the former case is afforded by Admiral Alexieff, who handled the military situation on the Russian side in Manchuria in 1904; his strategy has been subjected to severe and apparently well-justified criticism.

In the United Kingdom, as in Japan, it is important that some form of central control over sea and land forces should be devised to meet the conditions of certain possible wars; but for all we know an organisation has been devised, and is ready to take shape when the occasion demands. For the co-ordination of what we

¹ This holds good in spite of the successful tactical handling of fleets by the great soldier-admirals of the seventeenth century.

have called peace strategy, the machinery exists in the Committee of Imperial Defence, and since Mr. Balfour, when he was Prime Minister, devoted serious attention to naval and military questions, and other statesmen have followed his example, we must have made great progress towards a solution. We must be in a better position than we were when the late Duke of Devonshire drew attention about twenty years ago to the hopelessness of our system, looked upon as an organisation for the conduct of warfare.

ON THEATRES OF WAR

General Hamley, in dealing with military strategy,¹ enters a plea against introducing unnecessary complications into the study of warfare by defining terms which explain themselves. He quotes as an example this expression, 'theatre of war,' which has been defined as 'the whole area of ground which it is necessary to take into consideration during a campaign in order to construct correctly a strategical combination,' and he adds that everybody knows sufficiently well what is meant by the term. Most readers will give General Hamley their hearty support in this matter, and it is interesting in this connection to note the general tendency towards simplicity of language in the treatment of all subjects, as knowledge increases. In the early stages of any art or science the tendency appears

¹ *Operations of War.*

to be to resort freely to technical terms and polysyllables which may have the effect of obscuring rather than of simplifying the subject. On the question of science in general, we find Sir Oliver Lodge and other scientists avoiding unnecessary technicalities, and proving that it is possible to express the deepest and most interesting scientific truths in the simplest language; if this can be done in regard to sciences, for which regular laws have been formulated, and proved by experience to operate invariably in the same way, it ought to be easy in regard to warfare. The conduct of war has been compared to an art, rather than a science, because of the danger of formulating any rigid rules at all. Principles may be based upon historical experience; if care is exercised in examining in detail into the exact circumstances in which certain courses of action led to success, but the conditions of warfare are so varied that it is necessary constantly to remind ourselves that such principles serve as warnings, rather than as rules. In no sphere of human activity is surprise so important as it is in warfare, and the unexpected could never take place if rigid rules were always followed. There would be no scope for originality, which has been the most conspicuous feature in the plans of the greatest exponents of the art; 'the letter killeth' in strategy even as it does in religion, and with these considerations in view it will be as well to endeavour to avoid all dogma, and to

employ as far as we can only such terms as are current in ordinary conversation.

Looking at the subject from this point of view, let us again place ourselves in the position of strategists when considering 'theatres of war' in which the forces are to be moved. On land, most of these theatres of war afford obstacles to movement, such as mountains, marshes, and rivers, and the communications used by armies for their movements cross these obstacles by defiles; the roads and railways pass through mountain passes, over causeways, or over bridges, and the various ways of turning these facts to his advantage form a great part of the art of the military strategist. For instance, supposing that a mountain range runs across the line of advance of a hostile army, the delaying power which small forces can apply to an enemy of superior strength, advancing through defiles, can be used by a defender who masses his main body behind the mountain range; he can fall upon the portion of an attacking army which has come through one defile, and he can use the other defiles to delay hostile reinforcements which endeavour to reach the scene of battle. Obstacles in the theatre of war enable a military strategist to resort to several devices of this nature, and these devices have no parallel in sea warfare.

Then again, armies, with their *impedimenta*, require the use of roads, railways, or inland waterways for their advance, while fleets can

move freely in any direction in blue water, now that they no longer depend upon the wind for their motive power. In making this statement in regard to railways, it is necessary to note the limitations attached to this means of transport. In ordinary life we use railways as a means of increasing the speed of our movements, but when great armies are in question most careful calculations must be made to determine whether it will save time to send them by train instead of marching. The time required to get rolling stock together, to load up the trains with men, horses, guns, and wheeled transport, and to unload the trains, may be longer than that required to march to the destination. The problem will vary with every railway line; with a single line it is usually a question of getting the empty trains back, and the time required will depend upon the distance between sidings where trains can cross each other. The longest stretch between two such sidings may be looked upon as a sort of neck of a bottle, the size of which dominates the rate of flow. With a double line other considerations may be the dominating factor, and in all cases it will be possible to calculate the minimum distance for which it will be an advantage to entrain troops.

Another point about railways is that they are vulnerable, and liable to damage by hostile troops, so that it is not safe to calculate on using them within the enemy's possible sphere of action.

When it is a question of a very long journey, and the troops have recently been mobilised, it may be a good plan to make them march for the last stage or two. Kuropatkin made a very strong point of this, after his experience of the troops sent from Europe to Manchuria. A long railway journey does not improve the discipline or the mobility of recently mobilised troops; a march is good for both these attributes.

Roads are not as vulnerable as railways, excepting at points where they pass over bridges or viaducts, and inland waterways are even less vulnerable.

All these points affect the military strategist in his calculations, and it is necessary for him to give careful consideration to the communications of all sorts, as well as to the obstacles to movement in the theatre of war. Climatic conditions are also of great importance, affecting, as they do, both the rate of movement, and also the health of the armies. These complications are not introduced in the same degree into sea strategy, in which, moreover, forces move in a day as far as armies can march in a month. The application to armies of rapid movement by sea lends them a potential value to the strategist out of all proportion to their strength, but only when used against a country with a very long and accessible coastline, such as an island or a peninsula.

For the sea strategist the whole sea is his

theatre of war, the land and shoal water are his obstacles, canals and straits are the defiles. There are few places in the world where such defiles exist, and in such cases the strategist who controls them for his own use, while denying them to an enemy, obtains an obvious advantage: the Panama and Kiel canals afford examples.

CONCLUDING NOTE

After paying attention to the foregoing notes, we are in a better position to consider more definitely the methods which the art of strategy teaches its exponents to use the resources at their disposal, so as to secure victory over their opponents. These resources are fleets, armies, and aircraft, and we cannot too vividly realise the dependence that must be placed upon the spirit, enthusiasm, and discipline of the men, and upon good leadership. Given these qualities, time is the governing factor in the plans of the strategist. 'Ask me for anything but time,' is a saying of Napoleon's in regard to war that speaks for itself; every strategist with an elementary knowledge of his subject would say the same.

Comparing land and sea war in this respect, distances that infantry, the deciding arm in land battles, take days to cover can be covered by fleets in as many hours. The sea strategist must, therefore, think more quickly than his colleague on land, and his organisation for intelligence and control must be more perfect, because a delay of

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an hour at sea corresponds to a delay of more than a day on land.

We have noted that the work of the strategist under modern conditions must be strenuous and continuous in peace as well as in war. When war does come, he can watch the measured tramp of armed masses, or the fleets of heavy battleships under way, moving with set purpose to their destinations, and he can feel at that inspiring moment that every hour of dull detailed work to which he has devoted his life will tend towards the chances of victory.

CHAPTER III

ON OBJECTIVES AND ON SEA WARFARE

Objectives in Land War: Capital cities—Communications—Deductions—*Sea Warfare:* Comparisons—Communications—Blockade—Deductions—Armed merchant ships—Lissa—The future—Fleets and armies—Deductions—Tactical problem—*Amphibious War:* Fleets in harbour—Help to armies.

It is not necessary to labour the point that the usual object in a great war is to bring such pressure to bear upon the population of the hostile country that they shall be forced to give way upon the question of policy which has brought about the war.¹ The main instrument with which this result is to be brought about must obviously be some weapon which can be moved about; it cannot be anything of a sedentary nature, like a fortress. Nations cannot bring any appreciable pressure to bear upon each other by entrenching themselves behind fortifications, and hurling insults at each other from within such shelter; such entrenchments have their uses, as we shall see later, but only as auxiliaries to the mobile forces which operate by sea and by land.

¹ Wars in oversea territory, such as Cuba or Tripoli, are not classed as great wars from this point of view.

OBJECTIVES IN LAND WAR

The national weapon which can be moved about on land is, of course, the field army. The question arises, how best to use this weapon so as to bring the utmost pressure to bear upon the population of the hostile country. By seizing the capital city considerable inconvenience can be brought about; it is usually the centre of organisation and of government, and of the means of communication between the government and the population. It may also be the centre of information and control over the field armies and fortresses, but unless it is also a very great industrial centre, it is conceivable that the pressure brought to bear upon the people themselves by the loss of their capital city will not be sufficiently serious to force a conclusion. It is not very helpful to attempt to generalise upon such a subject; each country and each capital must be studied separately, and in order to illustrate this point we need take only two examples, the first from South Africa, the second from the United Kingdom. In South Africa in 1899-1902, the British army was employed to bring pressure to bear upon the population of the two Boer Republics. The seizure of their capitals, Bloemfontein and Pretoria, produced but little effect, the organisation and governing power was in the hands of a few strong personalities who moved about in Cape carts, and continued to exercise

their functions of control long after their capital towns were in the hands of their opponents.

To compare this with our second example. What would be the effect upon our conduct of warlike operations if a hostile army were in occupation of London? For the sake of our comparison we need not, for the moment, consider the economic situation which would have been brought about in these islands by naval conditions rendering a hostile occupation of London a possible operation, and we must look upon it as a separate problem of the occupation of a capital in land war. We are dealing with strategical objectives at present, and the effect likely to be produced upon the population of the United Kingdom if a hostile army made London their objective,¹ and succeeded in its occupation. We postulate their success, and by so doing we set aside the practical difficulties which present themselves to an army faced with the problem of how to occupy effectively a city, or group of cities, of four and a half million inhabitants, covering at least 75,000 acres of country. We set aside all consideration of the strength of the hostile forces required to dominate mobs of several millions of angry and desperate folk in

¹ In case any explanation is necessary of the meaning attached to the word 'objective' by military strategists, it may be as well to define it as 'that against which an army is directed.' It will be seen at once from such sentences as 'our object is to defeat the enemy' that the words *object* and *objective* are by no means interchangeable. An 'objective' can never be a verb or an abstract noun.

thousands of miles of streets. We set aside the difficulty an army would be faced with in procuring food amongst so many millions of poor folk who live from hand to mouth, keeping no reserves of food-stuffs, and we acknowledge that history provides us with no precedent for such a situation. We grant success to a hostile army in the effective occupation of London. In these circumstances, bearing in mind (1) that one-tenth of the population of the United Kingdom is crowded into the London area; (2) that London, besides being the centre of organisation and government, is a vast industrial centre; (3) that there are many important factories for war materials within its boundaries; and (4) imagining, as far as we can, the financial catastrophe which would ensue if the world's centre of exchange lost its fancied security, there is little doubt that the success of a hostile army in the occupation of London would bring such pressure to bear upon the population of the United Kingdom as to force them to make peace on terms unfavourable to themselves.

These two examples, drawn from South Africa and from the United Kingdom, have only been introduced in order to illustrate the impossibility of treating purely academically the question of selecting the capital of a hostile country as an objective for a field army.

Let us now consider another method of using an army to bring pressure to bear upon the

population of a belligerent country. The old method, still in force amongst savage races, was the comparatively simple and effective course of slaughter, pillage, and enslavement. This can no longer be put in force for three main reasons. Firstly, the advance of civilisation has induced all great nations to agree to bar such methods, and countries that tried them might bring down upon themselves the armed forces of all the other great nations. Secondly, armies which are allowed to pillage soon lose all discipline and control. And, lastly, field armies are so large nowadays that it is practically impossible to supply them with food and forage without relying upon the resources of the country passed through. The quickest method of obtaining these supplies is to keep the population in good humour, and to pay promptly for all that is taken. In 1870-1, although the operations were conducted in French territory, the German armies are said to have been supplied better than the French from the local resources.

While an army is debarred from the old method of slaughter, pillage, and enslavement to force a hostile population to concede a question of policy in dispute, there are other methods which may be made equally effective, if allowed sufficient time to produce their results. We have noted that land communications have been improved and cheapened to such an extent in all civilised countries that the populations have become dependent upon them for means of livelihood.

These communications, railways, canals, and so forth carry the raw materials of industries to the factories, and the finished products to their markets. The industrial population is, for the most part, concentrated round the factories which provide employment. Food-stuffs are not produced in sufficient quantity for their sustenance in the areas where they live, and, as a result, the means of communication are of vital use to them in bringing them their food. For these reasons an army can bring slow but effective pressure to bear upon a hostile population by seizing the means of communication and centres of distribution. These can be made the objectives of field armies, and their successful occupation may achieve the object in view, the domination of the hostile population.

So far, we have arrived at certain conclusions with regard to the pressure which an army can bring to bear upon the population of a hostile country by selecting certain objectives. Seizure of the hostile capital may or may not bring the war to an end, according to the special conditions applying to an individual country. Seizure of centres of distribution and of industry, and the occupation or destruction of communications, are likely, in time, to produce the effect desired in most civilised countries; such operations will become increasingly effective as industries develop more and more, under the conditions of modern civilisation.

For the sake of a clear understanding of the .

nature of warfare on land, it has been necessary for us to go into these matters, but we now come to the more definite consideration of objectives, as they affect the strategy of the armies themselves. It is conceivable that if a nation with an army were to go to war with another nation having none, then the capital and the communications of the hostile country would be selected as the first strategical objectives. But all civilised countries have armies of some sort, and it is the strategy of these against each other that we must consider. An army is an instrument of policy provided by the populace, both in its flesh and blood, its weapons, and its necessary supplies and equipment. The populace handles the army instrument through the government, and may be relied upon to see that the instrument is so used as to safeguard vital interests and economic life. If the capital is vital to national life, or if communications are essential to it, we may be sure that no army can strike at these things without having to fight its way to them. In all cases therefore, without exception, the most important objective in purely land warfare must be the enemy's field army. The object must be, sooner or later, to bring that army to battle, and the successful strategist is he who can arrange to have the advantage in strength, in position, and in moral force in the resulting combat.

If a movement on the capital can force an opponent to fight a battle at a disadvantage to

himself, by all means should such a movement be made. Napoleon employed this strategy successfully against Prussia in 1806, and unsuccessfully against Russia in 1812. The Allies employed it with success against Napoleon in 1814. If, on the other hand, a movement on the hostile capital exposes an army to the probability of having to fight at a disadvantage, such a movement, and the selection of such an objective, is bad strategy. The defeat of the hostile army is the first object, and the selection of other objectives must be considered only in their relationship to this primary operation.

SEA WARFARE

From the comparatively simple question of objectives in land warfare, let us now turn to the more complicated problem of the sea. In this part of our investigation it will be better to avoid altogether the expression 'objective.' The term is well known and accepted in land war, and is helpful to students of land strategy. In naval strategy, on the other hand, the use of the expression only tends to mystify and obscure, because the term is not usually current in the navy, and, when employed, is often given a different meaning to that which is recognised in land strategy.

Armies on land cannot be spread out or concentrated with the elasticity and rapidity of sea movements: large armies once launched in a given direction are less under control than naval

forces, and are more bound to certain lines of operations. With the sea all is different, the problems constantly change, and the movements of one force may almost instantaneously affect every other. As an example, historians have depicted to us the combinations, distributions, and redistributions of naval forces by Lord Barham which culminated in the battle of Trafalgar—a battle which was brought about, not only by the distribution of our fleets, but also by the effect upon Napoleon's mind upon the dispatch of a military expedition for Sicily. Another conspicuous point in the history of this and of other naval campaigns of the sailing period is the way in which all the junior admirals and captains acted without orders on their own responsibility, and nearly always did the right thing to further the great strategical plan. Great modern wars will be still more complicated; distributions can be changed far more rapidly than in the old sailing days, more countries possess naval forces, and the variety of warcraft and their armament constantly introduces new complications into the problem.

As a result of the constant grouping and regrouping of naval force, the whole pattern changes with the move of one piece. There is no parallel in land war, but, if in search of a simile, a game of Rugby football gives us the closest analogy to naval strategy; it is a perpetual succession of dispersions and concentrations,

all devoted to the same object, and every movement of an individual affects all on the field of play, where each must be in his place and perform his allotted task. It may reasonably be advanced that a Rugby football player is in no way assisted to learn the game, or his part in it, by being told that the other goal is his 'primary objective,' or that the man with the ball at the moment is the 'secondary objective.' The man with the ball is not the objective for the whole team, though he will affect the movements of the whole in some way or other.

We can also take a simile from the game of chess to illustrate our point. It is not so good a one because the pieces on each side are moved alternately, and they are stationary between the moves, while in football, as at sea, movements can be simultaneous. In chess the opponent's king may be called the 'objective,' but here again the use of the term does not assist towards a knowledge of how to play the game. As you probably cannot get at the king, you select some pawn or piece for attack, against which you think you can bring a preponderance of force. The enemy will either defend that piece to the best of his power, or attack some piece of yours that your move has exposed. Your strategy is determined by the varying position of the pieces all over the board, only one of which can be moved at a time. Naval strategy is somewhat similar, but affords less time to think, because the whole

situation is changing while you are making up your mind, and all the pieces on both sides can be moved simultaneously.

Let us approach this problem also from the point of view of the population which provides fleets, as it does armies, as instruments of policy, and let us assume that the policy is to bring pressure to bear against a hostile population. This brings us at once to what some writers consider the hub of the whole matter, which they sometimes call the control of sea communications, and sometimes 'Sea Power.' We touched upon the subject of internal communications of a country, and the effect upon the population of their loss, when considering war on land. Sea communications must be studied from much the same point of view. The populations of different countries are so dependent upon each other's resources that considerable pressure can be exerted by interfering with their external communications. It is impossible to devote too much care and attention to this subject, when considering the power any given country possesses to bring a sea war to a successful conclusion, and the great point to bear in mind is the essential difference between a continental country and an island in this respect.

To produce the maximum effect against the population of a continental country, it is necessary to consider both land and sea routes to other countries. If we think of the sea alone, we ignore

the possibility of commerce being diverted from the unsafe sea routes to safe land routes, through neutral countries. Such dislocation of the ordinary channels of trade is not quite a simple matter, and the diversion to land routes may be almost as expensive as paying the extra war insurance for continuing to use the ordinary sea routes. This will depend upon relative naval strength, and the efficiency of commercial blockade, which is becoming more and more difficult in these days of torpedoes, mines, submarines, and aircraft. We may assume, as a general rule, that much time is required before the population of a continental country will feel seriously the loss of external communications, provided always that the emergency has been foreseen, and measures have been taken if necessary to divert the traffic.

For the population of an island, on the other hand, the sea route is the only one available for commerce; there are no alternative safe routes through neutral countries, and interference with sea communications produces far more serious distress. For the United Kingdom, especially, is sea communication vital, because so large a majority of the population are dependent upon industries; these industries require access to other countries for raw material and for food, and also for markets for the manufactured articles.

Reverting to the question of sea strategy, we note that by attacking trading vessels using the

sea communications, suffering can be caused to the population of a hostile country. The amount of suffering, and the time required to produce an appreciable effect, will vary for different countries, but it is important to realise the true conditions attached to this interference with sea communications. There is a general tendency to assume that it means cutting off all traffic completely, but this is almost impossible. Such a result might be approached if a large number of war vessels were applied, at much risk to themselves from mines, torpedoes, and aircraft, in closely blockading some country with only one or two harbours. We have an example of the difficulty in the failure of the Japanese to cut off Port Arthur completely from the sea, even after the Russian fleet there had been sunk; and if it was so difficult to blockade completely a single harbour, the difficulty of shutting off a country with a long coastline from all communication by sea is an obvious one. It is not a question of investment, as applied to a place on land to which all access can be denied by a fortified girdle, manned by troops. Much traffic will pass by sea, but some vessels will be lost. The point is that the transport of goods will be more costly, owing to the price of insurance against war risks. The underwriters hold the key to the situation.

If trading vessels are attacked in naval strategy, the object is thereby to produce such an effect upon the underwriters that they shall charge

prohibitive premiums for war insurance of ships and cargoes. This will have three results: (1) sea-borne raw materials will cost more at the factories; (2) sea-borne manufactures cannot be sold in their usual markets at a profit, excepting at increased prices; and (3) sea-borne food will cost more. All three factors will bring about suffering in an industrial population. Their cumulative effect may make it impossible for them to carry on a war.

Before drawing further deductions, it is necessary here to interpolate a note that it appears to be possible for a government, to some extent, to prevent excessive rises in war insurance premiums, and the increased cost of sea transport which would result. Governments know, or should know, exactly what the naval situation is at any given moment; they therefore know the real risk run by merchant vessels on every route. The underwriters do not know this, and, in order to cover themselves, are obliged to charge panic rates, based upon imaginary risks. If it were possible to establish some form of national insurance or of national guarantee, the war premiums need only cover actual risks, or, in the interests of the population in general, they might even be abolished altogether. Opinions differ in regard to this matter, but it has been necessary to refer to the point, as it bears upon the question of the effect which can be produced by attacks upon sea-borne trade. If practicable

at all, it could only be effective as long as the real losses were comparatively small in proportion to the total sea-borne trade, and this in the end is a question of relative naval strength.

We have arrived at the conclusion that at sea, as in land warfare, interference with communications brings pressure to bear upon the population of a hostile country in direct proportion to their dependence upon such communications. For instance, people who rely upon sea communications for bread-stuffs can be made to suffer more than people who rely upon them only for tea and coffee. If the life of a people depends upon cheap raw materials, and cheap access to oversea markets for the products of industry, and at the same time most of the staple food-stuffs are imported by sea, we get the extreme case. An example is afforded by the population of Lancashire, engaged in the cotton industry.

In the case of land warfare, we saw that an army, before seizing communications and centres of distribution, with the object of bringing pressure to bear upon a hostile population, is first confronted with the problem of defeating the hostile army. It remains for us to consider whether similar conditions obtain in sea warfare. In other words, is it essential to defeat the hostile fleet before conducting operations against merchant vessels? Here we have to deal with conditions which have no parallel on land; let us dip a little way into history to illustrate the

difference. We are considering objectives for the national weapon which can be wielded at sea, and this weapon is the national navy, with its vessels varying in nature according to the functions which they are intended to perform. In the old sailing days, the records tell us that the most successful attacks upon sea-borne trade were conducted, not by national navies, but by privateers. Private individuals at their own expense fitted out fast armed vessels to prey upon an enemy's merchant ships, and repaid themselves out of the profits made by capturing the private property of citizens of the hostile country. Privateering at sea was abolished by the Treaty of Paris in 1856, and the question has not again been raised. Great Britain, holding the predominance at sea for a century, maintained that war at sea should be waged only between vessels properly commissioned as warships, in their own ports, by authority of their respective governments.

While privateering remains abolished, an important new factor has entered of late years into the conduct of sea warfare; the question has been raised whether it is necessary for vessels claiming belligerent rights as war vessels to be commissioned as such in the ports of their own country, or whether they can leave their own or neutral ports as merchant ships, and be subsequently converted into war vessels on the high seas. The importance of coming to an under-

standing on this point is obvious. If such a course is sanctioned, then attacks upon commerce can be made in all parts of the world simultaneously with the outbreak of war, without any regular war vessels, built as such, being employed for the purpose.

The question came to the front during the Russo-Japanese War; Russia in 1904 possessed certain armed merchant ships in the Black Sea, and by international treaties she could not pass them into the Mediterranean as war vessels; she therefore sent them out under the merchant flag, and they subsequently hoisted the warship ensign, and claimed to operate as war vessels. Great Britain protested, effectively for the time, but failed to bring about a concurrence with her views at a recent conference at The Hague. The attention of a subsequent conference in London was called to the point, but the Declaration of London in 1909 contained no reference to the subject, and, since that date, it is believed that certain naval Powers have arranged to convert their merchant ships into commerce destroyers on the high seas in the early days of war. To provide a war vessel, built as such, to watch every foreign merchant ship capable of conversion into a man-of-war, in whatever part of the world she may be trading, would involve the provision and worldwide dispersion of naval force which the richest country could not face. In the old privateering days the East Indiamen were armed to protect

themselves on the long trade route to the East round the Cape; in these days there are trade routes of equal or greater value to all parts of the world.

It has been necessary to go into these matters in some detail in order to show that, in considering sea warfare, we have to bear in mind that it is possible that mercantile commerce destroyers will be employed for attacks on merchant shipping, thus leaving the regular war vessels of the nation free to devote attention to other operations. Let us now consider these.

Admiral Mahan has shown us, in great detail, how the control of communications at sea depends ultimately upon great battles at sea, in which all available strength is used on each side, on the same principle that the control of territory is attained by battles between armies. An army, as we have seen, gives the hostile army its chief consideration, and we find that the same principle must apply to fleets. This does not imply that it is always simply a case of both fleets putting to sea, seeking each other out, and fighting a battle at once. That would obviously be a bad policy for the weaker fleet to pursue. The object on each side will be to bring about a battle on advantageous terms, and many subsidiary operations may be conducted in order to gain such advantage, but the point is that by sea, as on land, the defeat of the hostile mobile force is the principal object to be kept in view,

and any operations which ignore this principle are attended with the gravest risk. Thus a fleet can make merchant shipping, or an outlying island, an object for attack at first, but the influence of such operations upon the prospect of defeating the enemy's fleet is an all-important consideration; this essential condition must always be borne in mind. Let us take the naval campaign of Lissa as an example of the danger of departing from the principle; it is not a very good one, because of the influence of the personal element and other factors, such as the battle of Custoza, upon the conduct of the operations.

In the year 1866 a great transition was taking place in the nature of war vessels. Wood was giving place to steel, armour was being introduced, and steam had to a great extent superseded sails as a means of propulsion. War was declared between Italy and Austria on the 20th of June in that year. As regards ships, the Italian fleet, under Persano, was considered to be much superior to the Austrian fleet, under Tegethoff. When war broke out the Italian fleet was at Taranto,¹ the Austrian at Fasano, near Pola. On June 22nd Persano left Taranto, and arrived at Ancona on the 25th. On the 26th-27th the Austrians appeared off Ancona, but Persano did not put to sea. Between the 8th and 13th of July Persano was at sea and reconnoitred Pola, but Tegethoff remained at

¹ For movements see Map I, opposite p. 90.

anchor under the defences of that place. On the 16th of July Persano again left Ancona with his fleet, accompanied by troops in transports. He arrived off Lissa on the 18th, divided his force, and committed the whole of it to an attack upon the island, which was fortified, and contained a garrison of about 1800 men. He concentrated his attention, and all his resources, upon this operation, without ensuring early notice of the movements of the enemy's fleet. During attacks on the island on the 18th and 19th of July the Italians suffered some losses in men, and damage to ships, and at 8 A.M. on July 20th they were not at full strength, and not properly formed for battle, when the Austrian fleet arrived and defeated them in the sea-fight which ensued. Persano had altogether twelve armoured ships to Tegethoff's seven. His heaviest rifled gun was a 300-pounder to the Austrian 56-pounder. He had twenty-two unarmoured vessels to the Austrian twenty. The worst effect of the action upon the Italians was not the loss of a few ships so much as the effect upon the personnel of the proof that they could not meet the Austrians on equal terms.

Lissa is generally quoted as an example of faulty naval strategy. There would have been nothing wrong strategically in the attack on Lissa, provided that the operation had been skilfully carried out, that the personnel of Persano's fleet had been equal to that of the Austrians, and that

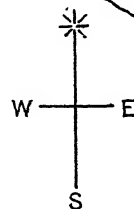
LISSA, 1866

Map No. 1.

Custoza
June 24th

Approximate Scale of Sea Miles.

50 25 0 50 100



CORSICA

Trieste
Venice

Pola

Ancona

Notes
Track of Italian Fleet →
" Austrian " →
The numbers in circles represent dates :— (19) (24)

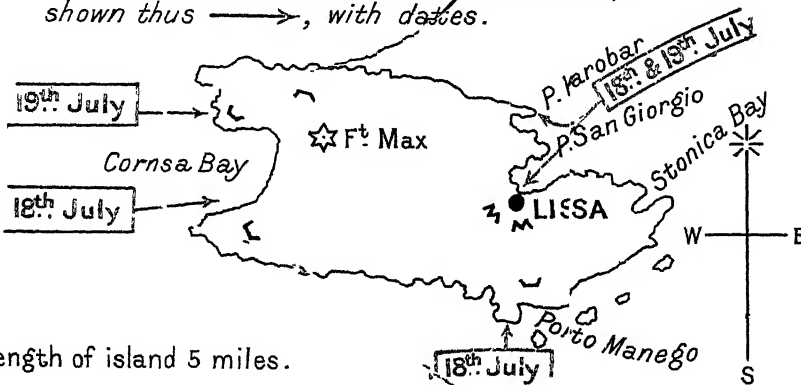
DALMATIA

LISSA
(See Inset Map)

ISLAND OF LISSA.

Note.

Attacks and demonstrations by Italian ships shown thus →, with dates.



Taranto

June

the Italian fleet had been ready to meet the Austrians when they appeared. It is conceded that the stronger Italian fleet gained a great advantage in drawing the weaker Austrian fleet to sea, but, when the Italians had done this, they were not in a position to take tactical advantage of the strategical success they had gained. The attack upon Lissa developed into a primary operation instead of a secondary one. No watch was kept upon Tegethoff's movements; the Italian fleet was taken at a disadvantage; its full force was not available against the Austrian fleet; for example, so much ammunition had been used up in attacking the Lissa forts that some of the Italian ships ran short in the fleet action. The example is a good one to illustrate the point that the hostile fleet must always be kept in view in naval warfare; other operations, against trade or against territory, must always be considered in their relationship to this principle.

At this stage in our investigation we are not concerned with theories regarding the nature of the national instruments that in future will dispute the command of communications by sea. Whether fleets, as we now understand the expression, will give way to submarines and aircraft does not affect the principle. The first attention in sea warfare must be devoted to the hostile mobile forces, whether they move on the surface of the sea, or dive, or fly. The control of communication by sea is the object in view; the

strategy must be decided accordingly, and suitable forces must be provided for the purpose.

We now come to another interesting question in sea warfare. If an enemy has both a fleet and an army, with vessels of some sort in which he can embark his army, to which should primary attention be devoted, the hostile war vessels or the hostile army? Mr. Julian Corbett, whose unrivalled historical researches lend to his writings an authority which it would be impossible to question, shows us in his book on maritime strategy that our old masters of naval warfare proved by practice that, when invasion of the United Kingdom was threatened, special attention was always devoted to the hostile army.¹ The usual conditions were (1) that the army was located at some port or ports, and in readiness to embark, and (2) that by making such distribution of our naval forces as would prevent its passage, and by covering that distribution with a battle fleet, we forced the enemy to attempt to concentrate a strong enough fleet to defeat our own. Before trying ourselves to provide an answer to our question, let us for a moment consider present-day conditions rather than the past.

Most continental countries are now covered by a network of railways leading from the military centres to many ports of embarkation, well

¹ For the full exposition of this theory the reader is referred to *Principles of Maritime Strategy*, to which book it has been impossible to do full justice in this chapter.

appointed as regards wharfrage accommodation. In the days of which Mr. Corbett writes land communications were difficult, and armies for oversea service were almost invariably collected for a considerable period at the proposed ports of embarkation, whereas nowadays troops can be kept distributed at their usual inland centres until the last minute, and then sent by train alongside the transports as quickly as arrangements can be made to receive them and take them to sea. Owing to the naval situation, several of the ports of a weaker naval power would probably be filled with suitable merchant shipping, and the naval strategist who decided to concentrate his first attention upon the hostile army must arrange to watch all such ports, because the enemy's intention might be to embark troops at any or at all of them. If the naval forces were split up to watch them all, such forces would risk defeat in detail by a hostile concentrated force. If, as sometimes happened in the old days, a hostile army destined for invasion is camped in readiness at some known place or places, and the hostile fleet is somewhere else, Mr. Corbett has shown us clearly what usually happened. We watched the ports containing the hostile army with observation forces, which we protected with a covering force, and we strengthened this covering force when requisite ; so it went on until all the available naval forces on both sides were thrown upon the army's line of

passage, and, as the enemy was never stronger than ourselves, invasion had to be abandoned. No admiral would like to face the task of fighting a fleet, even of equal strength, if his own fleet were handicapped by the care of helpless transports. The foundation upon which our whole plan was built was the separation of the observation force (employed to watch the located ports of embarkation) and the covering force, which was so posted as to engage the enemy's fleet if it attempted to clear the passage for the transports. It will be noticed that our procedure was built upon our knowledge of the position of the invading army, and the ports in which it was to embark. Modern conditions of land communication, wharfage, and sea transport have removed one of the factors of the policy, excepting in the case of opponents possessing only a short length of coastline. We are more likely to be able to locate a hostile fleet than an army, which will only be brought down by train to its ports of embarkation at the last minute ; but the question may be raised whether we are likely to hear that merchant ships in certain ports are being fitted up as transports. If this can be assumed, then present-day conditions are very similar to the past, but, for a short voyage, there appears to be little need of special fittings, unless the invading army is to be accompanied by a number of horses. If the dispositions made by the naval strategist ensure that the invader's fleets are brought to

action, wherever they may be, there can be little wrong with the plan. If an enemy discloses his intention to attempt invasion, such a disclosure is an advantage, as it may be assumed that his fleet will be drawn to the neighbourhood of the army's line of passage.

We must now consider some other conditions of this problem from the strategical point of view. The first of these is, which can do most damage to the population, the hostile fleet or the hostile army? The first can bring indirect pressure to bear by seizing merchant ships, the second can bring more direct pressure to bear by the methods we considered when dealing with objectives for armies. In the second case the people see their enemies, and feel their pressure, in the first case they do not. Great importance must be attached to moral factors of this nature, if it is correct to assume that the people, through their government, handle the instruments of policy, the fleets and the armies. There is little doubt that the population fear the operations of a hostile army on land more than they do the operations of a fleet at sea, whatever may be the relative nature of the real damage that each could inflict. In addition to the forces required by the naval strategist to deal with the hostile fleet, it is essential that enough naval force shall also be provided to attack and destroy the transports full of hostile troops as soon as they can be located; fortunately this is an easy task,

compared with what it was in the old days. The torpedo has worked a revolution. Heavily armed war vessels are not required to deal with transports themselves, sea-going torpedo craft suffice for the purpose, but to enable these to do their work it may also be necessary to provide against interference by the escorting vessels, if carrying a formidable armament.

To bring the old days before us, let us refer for a moment to the instructions issued to Keith from the Admiralty when invasion was feared in 1803. The following words occur in these instructions: 'On falling in with any vessels or craft of the description above mentioned' (viz. having troops on board) 'to relinquish all idea of capturing them, and to take the most speedy and effectual means of destroying them, either by running them down or by sinking them in the most expeditious manner: but if neither of these modes of destroying them can be immediately effected, to direct the officers to take away and break their oars, unhang their rudders, and cut away their lower rigging, masts, and anchors, so as to render the said vessels or craft totally unmanageable, and unable to pursue the object to which their operations were intended to be directed.' Compare these cumbrous operations with the simple one of pressing a firing key, and so discharging a torpedo which will easily blow up a merchant ship full of troops and send her to the bottom.

All things considered, it is difficult to avoid the conclusion that in all circumstances the true end and aim in all strategy is to concentrate attention upon the war vessels¹ of the enemy, even as in land strategy it is to make the hostile army the primary objective. It is necessary to add the proviso that sufficient torpedo craft must always be kept at hand, over and above the number required for the sea-going fleet, to sink an enemy's transports, if he should attempt to send an invading army by sea. Provision must also be made to deal with the transports' escort, and with all such craft as may be converted into supplementary war vessels for depredations on commerce.

In the days of sailing ships, when invasion was threatened, the tradition appears to have been to distribute the sea-going fleet so as at all times to be ready to bring overwhelming strength to bear in home waters. With the question whether this was theoretically sound strategy we are not concerned; the great point is that in practice it always led to ultimate success, because it obliged an enemy contemplating invasion to dispose his naval forces in such a manner as to try and guard the passage for his transports, and he thereby gave our fleets the opportunities for which they sought. The selection of armies as objects of prospective attack was facilitated, as we have

¹ Including, of course, those detached from the main battle fleet as escort for the transports.

seen, by the necessity of concentrating those armies at certain ports, and making special preparations for their embarkation. The armies and their transports could therefore be definitely located. There appears to be no necessity to disclose plans of invasion so long beforehand in the present day, but if they are so disclosed it is possible that the strategy of the old wars would still prove equally effective.

In the foregoing remarks we are dealing with the question purely from the strategical point of view; but although we are dealing with strategy, it is impossible to avoid all reference to the tactical situations which are ultimately brought about by strategical dispositions, and it is necessary here to make some reference to tactics in battle. Let us consider a hypothetical situation. It is reported to an admiral in command of a fleet that the enemy's fleet is approaching on one bow, and at the same time a number of hostile transports have been sighted on the other bow. For which should the admiral make with his main force, the fleet or the transports? He may have foreseen the possibility of finding himself in some such case, and he may have consulted historical precedents bearing upon the situation. If he detaches a large proportion of his force to attack the transports, and so leaves his main body numerically weaker than the hostile fleet, he will know that Nelson once proposed to adopt a similar course. When Napoleon moved a

fleet and an army together to Egypt, the plan formed by Nelson was so to divide his force as to leave his main fleet numerically inferior¹ to the French, on account of the detachment which he proposed to make to deal with the French transports.

If the admiral in whose position we are endeavouring to place ourselves, by attacking the transports, offers any tactical advantage to the hostile fleet, and thereby suffers decisive defeat, then no historical precedents will save the United Kingdom. The question of control of sea communication will have been settled in the most effective² way, by a great sea battle. If it be granted that sea communications are vital to the population of the United Kingdom, this of itself will ultimately settle the issue of the war. If not, the control of sea communications will enable the enemy to employ more troops for an invasion in earnest, and in almost unlimited strength, to give the *coup de grâce*.

Having quoted the reported intentions of Nelson when faced with a similar problem,

¹ He proposed to use eight or ten ships of the line against eleven French. Taking the moral factors of the time into consideration, he may not have thought such a proportion inferior.

² The word 'usual' was first written. The alteration was made because very few great sea battles have been decisive, and when they have it has not been due to any small difference between the numbers of ships on each side, but to the marked inferiority of the personnel on the losing side. Cf. Trafalgar, Tsushima, etc. The great fights in our Dutch wars and French wars of the eighteenth century, where the fighting qualities of the personnel were more nearly equal, were generally not decisive.

intentions which we must note were not tested in practice, let us examine another historical example.

Certain instructions issued by Keith in August 1803 might be quoted as authority for devoting chief attention to the transports. The words in the instructions referred to ran as follows : 'Directing your chief attention to the destruction of the ships, vessels, or boats having men, horses, or artillery on board (in preference to that of the vessels by which they are protected).' Reference to manuscript copies of these instructions, which are preserved in a book of Admiralty Secretary's In-letters, shows that they were issued to certain vessels distributed at anchor in the Thames estuary, and stationed there with the special purpose of dealing with such invading forces as might escape our sea-going war vessels. It would for this reason be a mistake to seek guidance from these instructions as a help in solving the problem presented to the admiral of a sea-going fleet.

Another condition which must not be ignored, when seeking help from history, is that in the sailing days the time problem affected a tactical situation differently. Vessels actually within sight of an action might require many hours before they could take part in it, owing to the direction of the wind. In these days it is a question of minutes, since vessels propelled by steam are independent of the wind.

We must here leave our imaginary admiral with his tactical problem.¹ Tactical situations develop rapidly at sea, and he must solve it in about twenty seconds if the best use is to be made of the resources at his disposal. The issue of a great war may depend upon his correct decision. His problem will be very different from that with which the Italian admiral Persano was faced in 1866. His alternative objective, the hostile field army, would be capable of doing great damage if allowed to reach its destination; the island of Lissa could have done no damage to anybody. On the other hand, success in destroying the hostile army would afford but little compensation for failure against the hostile fleet. The enemy would have lost an army, the United Kingdom would have lost control of sea communication, upon which the population depend for a livelihood.

Having studied objectives in land wars and in sea wars, we can now turn to the selection of objectives in wars which can best be described as amphibious.

OBJECTIVES IN AMPHIBIOUS WAR

In the preceding pages on land war we have dealt with objectives for field armies. Similarly

¹ According to the Admiralty notes supplied for the use of the War Office in the debate that was to have taken place in November 1910 in the House of Lords, it might be that the fleets would engage each other, while the destroyers and submarines torpedoed the transports.

in sea war we have studied the most effective employment for fleets. There remain for consideration the objectives in amphibious strategy, or, in other words, those against which the operations of both naval and military forces can be directed.

That 'war vessels cannot climb mountains' is a fact there is no gainsaying. In the year 1886 it was brought home to the Great Powers by the mountaineer population of Crete, and the point was further impressed upon them by a cartoon which appeared in a certain Greek comic paper. A large and powerful fleet, flying the flags of most of the European Powers, had assembled in the harbour of Suda Bay to impress the population of the island, during one of the many difficult situations which used to occur in those regions; the cartoon showed the international fleet at anchor, and the Cretans making contemptuous gestures at it from their homes on the distant mountain-sides. The appreciation of the strategical situation was correct.

Another attribute of war vessels is their great vulnerability to attacks from below the surface of the sea, by the torpedo and the submarine mine, which can be employed most effectively in the neighbourhood of the land. Ships offer conspicuous targets to the armament of modern coast forts, which can themselves be made almost invisible at long ranges. Gun-fire can sink ships, but their return fire cannot sink forts. Again,

the time seems to be approaching, if it has not already arrived, when it will be possible for aircraft to do great damage by dropping bombs on the decks of war vessels which venture near a hostile coast. For these reasons no admiral is willing to employ his fleet in forcing a way into a defended harbour to get at a hostile fleet sheltering therein. What then can be done? Some day perhaps it will be possible to force such a fleet to sea, or sink it at anchor, by the use of aircraft; in past wars the only way to bring about this result has been to employ an army for the purpose.

We thus get a definite objective in amphibious strategy, a hostile fleet sheltering in a defended harbour; it is an objective not for a fleet alone, nor for an army alone, but for the two combined. The Russian fleet in the harbour of Port Arthur in 1904 affords the best modern example, but it is not difficult to find many others in history. It is the most modern wars that afford profitable study, if the object is to learn lessons for guidance in the future; in the old sailing days the conditions were different, movements of ships were so dependent on the wind that it is better to rely upon more recent experiences, gained since the introduction of steam. For instance, we read of blockading fleets in the old days being blown off the stations they had taken up to watch defended harbours, and the blockaded fleets taking advantage of the favourable wind to escape;

steam has eliminated such conditions from the problem.

From quite recent history we can quote the cases of (1) Cervera's fleet, which was driven out of Santiago harbour by Shafter's army in the Spanish-American War of 1898; (2) the Chinese fleet, that was driven out of Port Arthur by a Japanese army in 1894, and subsequently destroyed in Wei-Hai-Wei harbour by the combined operations of a Japanese army and fleet; (3) the Russian fleet, that was driven out of Port Arthur harbour by an army in August 1904, returned there much knocked about by the Japanese fleet, and was finally destroyed in January 1905, after prolonged operations by the Japanese army and fleet. It is not necessary to go further into the history of these illustrations, as they have been described elsewhere.¹

Before selecting a hostile fleet in a defended harbour as an objective for an army, one very important point must be studied; there must be no superior hostile army within striking distance. This condition was fulfilled in all the historical examples we have quoted. In the case of the Port Arthur fleet in 1904 it is true that there was a strong Russian army to the northward, but the Japanese employed land armies of sufficient strength to prevent this force from coming to the assistance of the Russian besieged fleet. The Great Powers maintain vast armies which they

¹ See *Letters on Amphibious Wars*.

could bring to the relief of fleets sheltering in the harbours of their own countries, but not to the relief of those sheltering in harbours beyond the sea, unless they first obtained control of sea communications in the usual manner.

We have seen how a hostile fleet in harbour can be selected as an objective for both army and fleet in amphibious strategy; it remains for us to consider to what extent a hostile field army can be so selected. A direct effect cannot be produced unless the hostile army is close enough to the coastline to be within the range of gun-fire from the five-fathom line. A field army taking refuge in a coast fortress would present itself as an objective for combined operations; so would a field army fighting a battle with one or both of its flanks on the sea, as in the case of the Balma-cedist army covering Valparaiso in 1891, or the Russian army at Nanshan in 1904, but the places in the world where such conditions are likely to be fulfilled are exceedingly rare.

Where a field army is obliged to cross the sea in order to reach its destination, naval forces can interfere with its passage. Under other conditions fleets are usually prevented, by the nature of things, from direct participation in the defeat of hostile field armies; but although debarred from such direct action, they can help their own armies in many indirect ways. To these we refer in other chapters.

CHAPTER IV

ON CONCENTRATION

Difficulties—*In Land War*: Roads—Supplies—Peace distribution—Strategic deployment—Elasticity—*In Sea War*: Forcing an issue—Disposition of force—*In Amphibious War*: Concentration of purpose—Example of Japan—Summary.

‘IN war everything is simple, but the simple is difficult,’ and in no other branch of our subject is the saying more true than it is in connection with the question of concentration. The end and aim of all strategy being to concentrate a sufficient force to defeat the enemy, it would seem, taking a superficial view, to be a simple matter to mass together all available forces, and keep them together in all circumstances in readiness for battle. It would be easy to prove theoretically that a strategist who proposed such a plan was obeying a sound principle, and was doing his best to carry it out with the resources at his disposal. If these resources were insufficient he could advance that he was not to blame. But unfortunately, when we devote attention to the nature of armies and fleets respectively, and to the conditions of their movement, we shall see that strategical concentration is not so simple a matter. Though it may be all-important to the strategist

to keep the principle in view, his difficulties begin when he applies principles to practice.

CONCENTRATION IN LAND WAR

When dealing with the concentration of armies, the first subject to study is the purpose for which they must be concentrated, and this very soon leads us on to time and space problems, when they should be concentrated, and where. The purpose of concentration can be assumed to be for strength in battle. The army must therefore be so disposed as to be ready to bring its full strength to bear in the shortest possible time, but we are at once faced with the question whether this condition is fulfilled by massing forces closely together. Suppose, for instance, that a large army has been collected and closely concentrated, and that it is then necessary to move it in some direction, no matter what. In most countries its movement while on the march will be confined to roads, and the smaller the area occupied, the fewer roads there will be leading from that area in the direction required. Suppose, as an extreme case, that there is only one such road. Troops in column of route take up a great deal of space in depth, and if the object is to fight a battle facing in the direction of the line of advance, then the time required for the men in rear to get into the action will depend upon their distance from the front of the column. The length of the column will depend upon the breadth of the road,

and upon the composition of the army, whether there is a large proportion of artillery, how much transport accompanies the troops, and so on. For our illustration we can take von der Goltz's rule that not more than 30,000 to 40,000 men can be brought into action on one day if they are marching on a single road. With an army of modern proportions, then, we should soon find that the advanced guard was several days' march ahead of the rearguard. In fact, though we might have concentrated the army at first, the result of a few days' march along a single road would be that, from the point of view of readiness for battle, concentration would have been abandoned.

It is clear from the foregoing that, for the purpose of battle, the ideal is to march a large army not along one road, but on as many roads as possible, these roads being parallel to each other and all leading in the right direction, the total frontage occupied being that required for battle. This being the case, there is no advantage in closely concentrating the whole army in a small area, and then spreading it out again for a forward march. It would be better to distribute it in the first case in readiness for the required movement, with a portion ready to march along each most convenient road, and the theoretical strategist is at once confronted with the difficulty of finding a theatre of war which fulfils the condition of affording such marching facilities. Again, we saw, when studying objectives in land

war, that the enemy's field army cannot be ignored, and the roads selected must lead in the required direction to ensure meeting that enemy on favourable terms ; it is this consideration that dominates the selection of the theatre of war, and it is not a simple question of seeking the most convenient roads or other facilities for movement.

Suppose, for the sake of our argument, that the theoretical ideal is attainable, and that we can find plenty of parallel roads for our imaginary army leading in the required direction, and covering the frontage required by the army for battle. It is necessary to examine further into the question, and to decide whether this theoretical ideal will fulfil the necessary conditions, one of which is that, in order to ensure the greatest mobility and elasticity, an army should be as independent as possible of its lines of communication. In the chapter on this subject it is shown that in Napoleon's time a revolution was introduced in the methods of living on the country passed through by an army. The armies of the French Revolutionary period lived from the outset upon the country they traversed, and only relied upon magazines when such supplies failed them ; and, to take a more modern example, we have the authority of Prince Kraft for an estimate that in 1870 the German invading armies obtained at least a third of their supplies in this manner. If a large army remains at all times sufficiently

concentrated to bring its full strength to bear in battle, then it is impossible to rely upon this system, and it becomes necessary to fall back at once upon supplies collected in magazines or depôts, and issued therefrom with all the attendant delays in distribution. For rapid movement, living upon the resources of the country, the larger the areas from which such resources can be drawn the better, and hence the rule 'separate for supply, concentrate to fight.' From this it is apparent that instead of parallel roads, we require roads which at first are far apart, and do not converge until the army is likely to meet with strong opposition.

These notes will suffice to show that in land war, though the principle of concentration of force may be simple, its application is extremely difficult. Other points could easily be added, such as the question of health. If large numbers of men are closely massed together there is always a greater tendency to diseases of all kinds, from which the losses in strength are far more serious than from casualties in battle.

Again, it may be advanced that the initiative is so advantageous in strategy that it ought to be ensured by distributing the units of an army in peace time so that immediate concentration may be facilitated in war. Here again we are confronted with difficulties. Owing to the great cost, and to the loss of a country's productive wealth, it would be impossible to maintain the

vast armies of the present day at all times on a war footing. It is therefore the practice to maintain cadres only of the war units; for the rank and file to serve in these cadres for two or three years, and after that to pass into a reserve and support themselves in civil life. By these means a maximum trained army is provided for war at a minimum cost, but the system does not lend itself to concentration or immediate readiness for war. As regards concentration, in most countries the ranks are filled by conscription, and the units are raised in different parts of the country on a territorial basis, so that the burthen of service shall be properly distributed, and when it is necessary to mobilise for war the ranks can be filled rapidly, because the reservists are usually in the same part of the country as their units. This rule is followed as far as possible, and has the effect of expediting the process of mobilisation, the first process towards war concentration, but no country finds it possible to apply the rule in its entirety. It is not always desirable as a matter of policy to keep the local troops in their own part of the country.

We find, then, that concentration in peace time of all available strength is an ideal beyond the reach of the military strategist, and before he can decide upon his plan of campaign he must work out in great detail the time problem, firstly, how long it will take to mobilise the smaller units, then how long it will take to collect them and

form the larger ones, and not till then will he be in a position to decide upon their closer concentration upon what is usually called the line of strategic deployment. The railways are used to a great extent for the movements from the mobilisation centres to this line, and from this it is apparent that in making the calculations and selecting the line it is necessary to calculate also the time required by the enemy to carry out a similar operation. The detrainment and initial work at the railheads is such a complicated and vulnerable operation that it must be carried out undisturbed, and therefore beyond striking distance of the enemy's forces. It is not until all these details have been worked out, and all these calculations have been performed, that the roads for advance can be selected and allotted so as to ensure that, while separated to the full extent for supply reasons at first, the army shall be concentrated in full force for decisive battle.

When, in addition to all these points, we bear in mind that the unforeseen must always be provided against in war plans, and that for this reason the power of diverting force in a new direction should be maintained as long as possible, it will be conceded that, while the principle of concentration is an easy one to bear in mind, its execution presents considerable difficulty. In fact, the word 'concentration,' applied to land strategy, implies concentration of purpose, rather than constant concentration of force, the purpose

being to ensure greater strength than the enemy can bring to bear at the points where the decisive conflicts will ultimately take place.

CONCENTRATION IN SEA WAR

In naval strategy, again, it appears at first sight to be a simple matter to concentrate all available strength to 'seek out and destroy' the enemy's war vessels wherever they may be, but it is not so in practice. An army's requirements to maintain its mobility consist of food-stuffs and of forage, and these it can obtain in most countries by dispersion over a wider area; a fleet's requirements for the same purpose consist chiefly of coal, oil-fuel, and lubricants, and these it cannot find for itself on the high seas. Massing war vessels together at sea does not hamper forward movements to the extent that such a procedure does with an army, and if in harbour it is only a question of anchoring accommodation. Concentration for destruction of the enemy would therefore be clearly a most effective procedure for the side holding great predominance in strength, but it is necessary to bear in mind that there are two sides in war, and the weaker country is not likely to adopt a plan so disadvantageous to its own forces. Moreover, as shown in detail in the chapter on Fortification, weaker fleets can take refuge in defended harbours from which their expulsion is a matter of considerable difficulty, involving the employment of armies stronger

than any forces that can come by land to the relief of the place attacked.

The object of the stronger side being to induce the enemy's fleet to put to sea, this object is not likely to be attained if a greatly superior force is always massed in readiness in a convenient and obvious position. It therefore appears that great battles in which the issue is definitely decided one way or the other are not so easily brought about, and must be worked for by strategical dispositions of naval force, and by every other method that can be devised. The great sea battles stand out so conspicuously in history that there is an undoubted tendency for attention to be devoted exclusively to them, without studying the conditions by which they were brought about—in other words, without studying naval strategy. It has always been the case both on land and on sea that the story of great combats has exercised great fascination, while the patient strategical work which brought about the battles has attracted little interest or comment, because it does not lend itself in the same way to dramatic treatment. As a result, we need an effort of memory to recall the many years of sea warfare which were marked by no conspicuous incidents ; whole periods of patient waiting are obliterated by the memory of the great battles in which they culminated, and a leader like Nelson is remembered for the glorious battles of the Nile and Trafalgar, and not at all for periods in his career

li. : the eighteen months he was at sea in the Mediterranean, constantly racked by sea-sickness, but concentrating his whole attention upon the Toulon fleet. The fixity of purpose of our great naval strategist, Lord Barham, during the years when he was at the Admiralty pitting his strategy against the subtle brain of Napoleon, is a matter which has only recently been disclosed by historians,¹ and for every book on naval strategy there are probably hundreds on the strategy of armies.

If it be granted that for the stronger side to 'seek out and destroy' the war vessels of the weaker is not an easy matter, and that the operation is not likely to be brought to a rapid conclusion, we are now in a position to consider methods by which it may be possible to expedite the issue. The strategy of the weaker side is dealt with in the succeeding chapter on Dispersion, where it is shown that there are methods by which an enemy who has massed his forces may be induced to disperse them, and it is pointed out that in some circumstances this effect may be produced without the employment of war vessels, regularly built as such, for the purpose. Attacks on trading vessels in distant seas by armed merchant ships, commissioned as war vessels on the high seas, may

¹ Another conspicuous point in the history of this and other campaigns of the sailing period is the way in which the junior admirals and captains acted on their own responsibility, and, being trained in the same school of experience, nearly always did the right thing to further the strategical plan.

induce a strong enemy to disperse his own war vessels, if he has not foreseen the difficulty, and has not provided for the security of his ocean trade against such attack at the distant points of departure, and at the junction of ocean trade routes.

Turning to the strategy of the preponderant fleet, we have noted that concentration in superior force must be concealed from the enemy if he is to be expected to put to sea, and we will assume that he cannot be forced to do so by an army. It may be possible to leave him an apparent opening by temporary dispersion of force, while at the same time ensuring that he will not be able to gain a victory over one portion without the remainder coming to its assistance. We have historical examples of fleets being so dispersed and the threatened portions falling back to some strategic centre where support was at hand; if this was possible in the sailing days, when the direction of movement depended upon favourable winds, it should be more possible in these days of steam for movement, and wireless telegraphy for keeping touch between separated forces.

Then again, if we revert to our assumption that the population of a country, through the Government, will exert some power upon the strategy by land and sea, especially in a prolonged war, we can note the possibility of commercial blockade being so effective as to force the available naval

forces to attempt to break it down, and by this means the decisive action desired by the stronger fleet may be brought about. Commercial blockade cannot be combined with close concentration of force, unless the enemy has only one port, so the ideal would appear to be to separate sufficiently to make commercial blockade effective, and at the same time to be sufficiently within touch to ensure meeting with superior force whatever fleets or war vessels the enemy may send to sea.

In sea as in land war we find therefore that strategic concentration does not mean immediate and unvaried massing of force, but rather concentration of purpose, that purpose being to bring about a battle in which the chances of success will be on our side. All dispositions of force must provide for concentration at the right time, and at the right place, which place will be the situation of the hostile fleet, if we can get it to put to sea.

CONCENTRATION IN AMPHIBIOUS WAR

When considering concentration in the combined strategy of fleets and armies, there is no necessity to go into any detail to show that concentration of purpose, rather than close concentration of force, is what we mean, because the nature of things prevents fleets and armies from working in close contact with each other excepting on rare occasions. Concentration of purpose

in amphibious strategy implies, of course, that attention for the time being is concentrated either upon the hostile fleet or upon the hostile army, and the land and sea operations are conducted accordingly. In the British Empire especially it is impossible to devote too much attention to such concentration of purpose, and so far few writers have devoted serious attention to the subject. For the most part land strategy and sea strategy (as far as they have been written about at all) have been dealt with in 'water-tight compartments' as separate subjects. We are fortunate, however, in having in the Russo-Japanese War a conspicuous example of such concentration of purpose under modern conditions. It must have been recognised by the Japanese that the defeat of the Russian army based on Harbin was essential to their purpose, but they also saw that local command of the sea was their first requirement. When it was found that by naval action alone it was impossible to destroy the Port Arthur fleet, we find a Japanese army combining with the navy, and succeeding in capturing the Russian war vessels after the most strenuous exertions and staggering losses. Not until after Port Arthur had fallen was it possible for all the available military forces of Japan to be concentrated upon the Russian field army, which meanwhile had been constantly reinforced. This is an example of the exceptional case where, not only was there concen-

tration of purpose between naval and military forces against a hostile naval force—the Russian fleet,—but also concentration of a fleet and army to achieve the purpose ; in studying war histories we are constantly struck by the influence of distant military operations upon the naval situation, and the converse also holds good. As an example, it was the land situation in Sicily and Southern Italy, and the dispatch of Craig's military expedition from England, that incited Napoleon to force the fleets to sea from Cadiz to fight at Trafalgar, and the result of that battle was to settle for the time the question of the invasion of England. Thus there are endless possibilities in amphibious strategy for concentration of purpose, by so arranging that both fleet and army work together, however far apart they may be, either for the defeat of a hostile fleet, or for the defeat of a hostile army, whichever of these may at the time be the most important.

SUMMARY

From the foregoing pages we can deduce that, while the principle of concentration of force is a simple one in all natures of war, many complications are introduced in putting the principle into practice, and to such an extent is this the case that the expression 'concentration of purpose' is more apposite than 'concentration of force,' if we consider the whole period of a war,

instead of only the exceptional periods which precede great battles. In dealing with concentration, it has been impossible to avoid all reference to dispersion of force, especially as a method applied by the stronger side in naval war to induce the weaker side to concentrate, but as there is a good deal more to be said on the subject of Dispersion in general, it will be dealt with in further detail in the next chapter.

While recognising the need for concentration of purpose, it is also necessary to realise that this purpose must be to defeat, and if possible to destroy, all the mobile forces which an enemy can put into the field of operations, or upon the high seas. This entails sufficient concentration of force to achieve the purpose. If the strength available at sea does not suffice for such strategy to be carried out in its entirety, then attention must first be concentrated upon forces which, in Kempenfeldt's words, 'could most injure you.'¹

¹ See page 132.

CHAPTER V

ON DISPERSION

Detachments to prevent Concentration: Containing forces on land—1814—Interior lines—Containing forces at sea—Kempenfeldt—*Detachments to induce Separation:* Strategic detachments on land—At sea—Influence of population—Amphibious war—Conclusion.

IN the preceding chapter we paid special attention to strategical concentration, and we studied some of the conditions which affect such concentration. We reached the conclusion that we mean concentration of purpose throughout a war, rather than immediate and unvaried concentration of all available forces. The purpose upon which attention is concentrated is, sooner or later, to bring about a decisive battle, and by sufficient concentration of force to ensure success in that battle. We have studied the various factors, apart from numerical strength and superiority of armament, which affect the sufficiency of the force employed, and the strategical result which will follow tactical success. We have seen that immediate concentration of all available forces may be delayed by the nature of things, both in sea and in land war; by time required for mobilisation, geographical distribution of the forces, and the distances intervening between such forces and the centre of

concentration. We now come to an aspect of the question which introduces much subtlety into the art of strategy.

We shall endeavour to study whether it is always undesirable to disperse sea and land forces, when such dispersion is not forced upon us by the nature of things. In this investigation we shall be obliged to use certain strategical terms, such as 'containing forces,' 'interior lines,' and 'strategical detachments.' It is hoped that these terms explain themselves, and require no special definitions; they have an accepted significance on land, and our object will be to apply them at sea in a similar manner, in order to avoid confusion of thought; in order to follow up this plan, it will be necessary to take the land aspect first.

CONTAINING FORCES ON LAND

Let us imagine the outbreak of a land war in which one belligerent possesses an army weaker than those of the hostile country or countries, and let us further imagine that the hostile armies are so distributed geographically that it will take them some time to concentrate. If the belligerent whose plans we are considering masses his whole available strength and awaits attack, it is clear that he may not have as many troops as the enemy on the field of a decisive battle. Strategy will not have helped him to a chance of success. If one of the hostile armies, weaker than his own, comes within reach, while the other

hostile armies are beyond supporting distance, then he can attack with every prospect of success, because the enemy's strategy has been faulty. This brings us to our point.

Let us consider a case where the hostile armies are so disposed that, unless something is done to delay them, they will have time to converge and take part in the decisive battle. What can the weaker side do, in such a case, to gain superiority for a sufficient time to secure a tactical success? He may find it desirable deliberately to divide his force; while keeping sufficient troops concentrated for the battle, he can send away small containing forces to delay all the hostile armies with the exception of the one he intends to fight first. It will only be necessary for his purpose to delay those armies which are near enough to deserve consideration, and by such procedure he will be able to ensure that, although weaker than his enemies in the theatre of war, he will be stronger on the field of battle, which is the end and aim of all strategy. We thus get a case in which separation of force is in accordance with concentration of purpose, that purpose being superiority on the field of battle.

The conditions that must be satisfied, before the military strategist can take advantage of such a stratagem, is that his armies must be on what is called 'interior lines' in regard to the armies opposed to them. They must be so placed that they can reinforce each other more rapidly than

their opponents can; this does not necessarily imply that they must be closer together in point of distance; an obstacle, such as a mountain range, a marsh, or a desert, may intervene between the enemy's armies, which are quite close to each other. The essential point to consider in such a case is the time required to cross the obstacle, rather than the distance to be covered.

The conclusion we have reached is that division of force in land warfare may enable the side with the weakest army in the theatre of war to have the strongest on the field of decisive battle. This is a conclusion of such far-reaching importance that it will be as well to elucidate the point still further by examining a historical example. We will take Napoleon's campaign against the allies in 1814, which is used by Hamley as an example of the use of obstacles in land war. Their chief use in that campaign was to give an added time value to the 'containing forces' employed by Napoleon to keep away from the decisive battles the enemy's armies, which might otherwise have been thrown into the balance.

CAMPAIGN OF 1814¹

Napoleon, in 1814, was faced with the problem of meeting the advance of the Allies into France from several directions. Schwartzenberg was advancing with an army of 96,000 infantry and 21,000 cavalry by the Belfort gap, between the

¹ See Map II., opposite p. 128.

Vosges and Jura mountains. Blücher was advancing with 69,000 infantry and 19,000 cavalry from the Rhine, about Mayence and Mannheim. A force of two corps, say 40,000 men, under Bülow and Winzingerode, having expelled the French from Holland, were advancing via Avesnes.

To these armies Napoleon could oppose only 70,000 infantry and 17,000 cavalry, which were reinforced during the campaign by reserves drawn from Paris and from the Pyrenees. Against these reserves we must put 50,000 which Schwartzemberg had at his disposal at Basle, under Barclay de Tolly.

Napoleon in the first instance distributed his forces so as to delay the advance of the hostile columns, and he based his plans on the assumption that the invading armies must detach a considerable proportion of their forces to watch the fortresses which lay in their way. By the 25th of January the French troops which had been opposing Schwartzemberg and Blücher had fallen back on S. Dizier and Vitry, and on that date Napoleon went to Chalons and operated on interior lines to such effect that he kept the Allies away from Paris until the 29th of March. Even when they arrived there the situation from the military point of view would not have been hopeless, if the feeling in the country, which was reflected in his army, had not forced him to abdicate.

The movements of the armies were too intricate

to describe in the space at our disposal; full use was made of obstacles to movements afforded by the rivers converging upon Paris, and skill was displayed by the French forces fighting for time on one side of the theatre of war, while they fought for victory on the other side. It will suffice for our purpose to note Napoleon's own movements during the operations. On the 25th of January he was at Chalons, on the 26th he moved from Vitry, and on the 27th he drove a portion of Blücher's force out of S. Dizier. On the 28th he moved on Montierender across country. On the 20th he came into the Aube valley near Brienne, and waited on the line Dienville-Morvilliers. On the 1st of February he was attacked by Blücher's and Schwartzberg's armies and fell back to Lesmont. Blücher and Schwartzberg then separated, the latter moving on Troyes, the former northwards towards the river Marne, and from this date the French armies operated on interior lines.

On February 5th Napoleon demonstrated against Schwartzberg from Troyes. On the 6th he moved to Nogent, leaving a small force to delay Schwartzberg. On the 9th he moved to Sezanne. On the 10th he struck at one of Blücher's Russian corps and destroyed it; he then moved through Montmirail after another portion of Blücher's force under Sacken, whom he defeated and drove beyond the river Marne at Château-Thierry. On the 14th he attacked

Blücher at Vauchamps, and drove him half way to Chalons; leaving a small force to delay him, Napoleon then turned his attention to Schwartzenberg.

By the 17th Schwartzenberg's advanced troops reached Mormant, but were then obliged to fall back on Nangis. On the 18th Napoleon moved to Montereau and crossed the river, forcing Schwartzenberg back on Troyes, which Napoleon captured on the 24th of February.

On the 25th of February he left Troyes and moved on Sezanne to attack Blücher, leaving a containing force as usual. On the 28th he was at Sezanne. On the 2nd and 3rd of March he moved by La Ferté on Château-Thierry to attack Blücher, who by this time was on the river Ourcq with Sacken's force, which had rejoined him. Napoleon continued his march to Fismes, compelling Blücher to retreat northward via Soissons over the river Aisne, where he was joined by Bülow and Winzingerode, from Laon. On the 5th of March Napoleon crossed the Aisne at Bery au Bac. On the 6th and 7th he attacked part of Blücher's force on the line of the river Lette, and on the 8th he attacked Blücher's main body near Laon. On the 10th he was pressed back by Blücher to Soissons. On the 12th he moved to Rheims, leaving small forces to hold Soissons and Bery au Bac. On the 13th, near Rheims, he dispersed a corps moving from the Rhine to reinforce Blücher.

Napoleon then rested at Rheims until the 17th of March, when he moved to Epernay to fight Schwartzenberg, who had moved westward again. On the 18th he moved on Fère Champenoise. On the 19th he crossed the river Aube at Plancy. On the 20th he moved up the left bank of the river to Arcis, where he was attacked by Schwartzenberg with superior forces. On the 21st he withdrew over the Aube, and reached Vitry on the 22nd, intending to call in all the forces that were available for further operations, and expecting that Schwartzenberg would fall back again, as he had before.

By this time, however, other factors had entered into the situation. Schwartzenberg, instead of retreating, faced the risk to his communications from attacks by Napoleon, and moved on Paris; Blücher extended his left and did the same, and the two armies, having regained touch with each other, forced the French containing forces back on the capital, which capitulated on the 29th of March. Napoleon, finding the feeling in the country against him, abdicated on the 6th of April.

Any reader who has had the patience to follow Napoleon's complicated movements on the map will be struck by his extraordinary genius in dealing with a desperate situation; also with the delaying effect which inferior forces can produce upon an enemy's movements, if they are skilfully handled, and if full use is made of the topo-

graphical features of the country to screen dispositions.

It will also be seen from the foregoing that the advantage of interior lines is one that cannot be maintained indefinitely. If the hostile armies, although defeated, are able to advance again after each defeat, their movements are convergent, and ultimately they will be in touch with each other; what has been a strategical advantage will then become a tactical disadvantage, and the armies on interior lines will be in a very difficult position. We cannot follow this up without trespassing too far upon the subject of tactics, but we can note that the advantage of interior lines only holds good so long as containing forces can keep hostile armies, stronger than themselves, away from the scene of decisive battle. How they can best do this is again, perhaps, a question of tactics, but it comes within the province where strategy and tactics overlap and cannot be subdivided, because containing forces do not fight for victory, but for time. A large army is a somewhat unwieldy machine; in most countries it moves along roads while on the march, and the distances it occupies along these roads are so great that, when the heads of columns are checked, many hours must intervene before the men from the back of the columns can come up into action. If only one road is employed, from 30,000 to 40,000, according to circumstances, can be taken as the

maximum number that can be brought into action in a day, and the mobility of armies in general may be said to vary inversely with their strength. Imagine then the opportunities offered to small and highly mobile forces for checking the advance of large armies, and so gaining the time required by the strategist for the success of his general plan. Even in open country they can sometimes force a large army to deploy; still more can they do so when obstacles help them, and where the conformation of the ground conceals their disposition. Their object will always be to cause as much delay as possible, without becoming committed to serious engagement, and they must not suffer such loss and deterioration of spirit as to unfit them for repeating their delaying tactics on the first favourable opportunity. They must therefore retire as soon as they are outflanked, and before they are cut off. It is only in very exceptional circumstances that, in order to gain enough time, they will be justified in committing themselves to decisive engagement, thus risking tactical defeat and even annihilation to gain a strategical success.

Operations by containing forces require the very highest qualities of leadership. Time is what is to be fought for, and the object is to deceive the enemy by every possible device in order to make him think that there is a large force in front of him, and so to make him waste time by deploying a larger force than he requires for

his purpose. The fabric of the whole strategical plan depends, as we have seen, upon the fact that large armies must usually move along roads, so that, during their strategical movements, it is impossible to bring their whole strength into a battle until a considerable time has been occupied in deployment. A small force deployed for battle can therefore delay the advance of a far stronger force on the march, and the uses to be made of this circumstance are of sufficient importance to be described by Hamley as 'the most effective weapon in the military armoury.'

CONTAINING FORCES AT SEA

We can now turn our attention to the question whether the same conditions obtain at sea, and whether, by the detachment of containing forces, it is possible for the naval strategist to ensure superiority in battle for fleets which are weaker than their enemies in the theatre of war. For sea strategy the whole sea must be considered for our purpose as the theatre of war, in so far as it is used by the contending forces.

In the first place, it will be noted at once that what Hamley calls the most effective weapon in the military armoury has no parallel at sea. Fleets do not move along roads as armies do, and it is possible for them to carry out their strategic movements in formations which enable them to bring their whole strength to bear in a very short space of time. Is it possible, then, for a weak

naval force to cause appreciable delay to a far stronger one, without being itself destroyed in the operation? We find some references to this point in historical accounts of the wars of the old sailing days, and Mr. Julian Corbett has collected some good examples.¹ He quotes, for example, a memorandum by Admiral Kempenfeldt, written during the war of American Independence, which has a special bearing on the point we are considering. On few occasions in history has the available strength of the British forces at sea been so small in proportion to the total forces opposing them, and these conditions necessitated some subtlety in strategy in order to ensure superiority in the decisive battles for sea supremacy. For such a result to be possible, it was necessary to weaken to the utmost all detached forces, in order to concentrate as many ships as possible to ensure the desired superiority at the point where it was most urgently required.

Kempenfeldt wrote: 'When you know the enemy's designs, in order to do something effectual you must endeavour to be superior to them in some part where they have designs to execute, and where, if they succeed, they would most injure you. If your fleet is divided so as to be in all places inferior to the enemy, they will have a fair chance of succeeding everywhere in their attempts.' This, of course, has its exact parallel in land warfare.

¹ *Some Principles of Maritime Strategy*, pp. 219-26.

Let us see further what guidance we can get from the memorandum for the conduct of what he calls 'squadrons of observation,' the naval equivalent of what we have called 'containing forces,' when dealing with a similar problem on land. Kempenfeldt writes: 'When inferior to the enemy, and you have only a squadron of observation to watch and attend upon their motions, such a squadron should be composed of two-decked ships only (that is, ships of the highest mobility) so as to assure its purpose. It must have the advantage of the enemy in sailing, else under certain circumstances it will be liable to be forced to battle or to give up some of its heavy sailers. . . . Such a squadron will be a check and restraint upon their motions, and prevent a good deal of the mischief they might otherwise do.' In other words, it was considered possible by Kempenfeldt to employ containing forces in the sea strategy of his day, but such containing forces had to sail better than the enemy, as a condition of their successful employment.

Even if we went deeply into questions of naval tactics, which are beyond the scope of a treatise on strategy, it would be difficult to prove that, under modern conditions, a small very fast fleet would have any appreciable delaying power against a larger and somewhat slower one, because we have no war examples to help us. Modern naval actions have been fought either for victory or for escape, they have not been fought

for time, avoiding serious commitment to battle, and this, as we have seen, is an essential condition of fights by containing forces. It may be suggested that a small and fast fleet, by following a large hostile fleet at sea, would be in a position to pick up 'lame ducks,' vessels repairing temporary damages, or breakdowns of machinery, and so could force the larger fleet to delay its movement. It may also be advanced that the small fast fleet might so place itself as to concentrate fire upon ships at the end of a long line, and thus compel some tactical manœuvre which would tend to delay. All this is conjecture, and we are obliged to leave in doubt the question whether naval forces, even with greatly superior speed, have any 'containing' value against fleets of greater strength than themselves. A new factor has been introduced into naval warfare since the range of gunfire has exceeded the range of visibility, and this factor seriously affects the handling of forces called by Kempenfeldt in the old days 'squadrons of observation.'

If it is possible to use small containing forces on the high seas, it is certain that only vessels of the very highest speed can be of any use for the purpose. Their speed must exceed that of the larger forces which they are expected to 'contain,' otherwise they will be sacrificed without achieving their object. Kempenfeldt, in his day, stipulated for outsailing the enemy in such circumstances.

This brings us to the problem of interior lines at sea, as compared with the same problem on land. Armies on interior lines can effectively use small containing forces to delay one hostile army while fighting another one, but we cannot show that fleets on interior lines can obtain any strategical advantage by similar procedure. The inference is that, at sea, the best strategy in such circumstances is to turn with all available strength against the nearest hostile fleet, in the hope of beating it thoroughly before others can come to its assistance. To illustrate our point, an example might be afforded by a fleet or fleets at or near Gibraltar operating against hostile fleets on the Mediterranean and Atlantic sides respectively.

DETACHMENTS TO INDUCE SEPARATION

In our study of the strategical use of containing forces, it will be noticed that, so far, we have chiefly alluded to strategy against an enemy who, for some unavoidable reason, has not concentrated his armies or his fleets, which are therefore in a state of dispersion. Many reasons, apart from unreadiness or slow mobilisation, may have brought about this result. On land, it may be that an army has been detached to watch the forces of some neutral whose attitude is doubtful, or to keep in order the population of a disaffected province, or for some other similar reason. At sea, again, the peace distribution of naval forces can

seldom be as one would wish it to be against any one particular country. If it were possible to know exactly with what foreign nation difficulties would next arise, some such distribution might be possible; but as this cannot be known precisely, war vessels may be distributed in peace time to guard the interests of their country in case several possible situations should develop. Unless they are on the spot where they are most wanted, when war breaks out it may be impossible to get them there in time to be of service; and the more widely dispersed these interests may be, the greater will be the tendency to dispersion, in order to watch the forces of various prospective enemies.

Let us suppose now that an enemy's forces are not found to be dispersed but concentrated, that is to say, within supporting distance of each other, so that he can bring them all into action in the same battle; land or sea strategists may then be faced with the problem how to induce their enemies to disperse. The statesmen may do this for them by contracting alliances with other countries having armies or fleets, and so sap away from the enemy's strength by forcing him to form detachments to watch these forces. This comes into the province of national policy, rather than of pure strategy, but it is one of the numerous cases where one has a dominating effect upon the other. Putting statesmanship aside, and taking the simple case of an enemy who is concentrated

in such force that we cannot expect to engage him with any prospect of success, we have to consider some of the methods by which he can be induced by naval or military action to disperse. This brings us to the general question of strategical detachments, and here again we will consider the land first, and then the sea, so as to employ the same nomenclature to convey the same meanings.

STRATEGICAL DETACHMENTS ON LAND

The containing forces, with which we have so far dealt, may be classed as strategical detachments employed against armies which are already separated. We now pass to methods resorted to in order to induce separation. This subject has been very thoroughly dealt with, as regards land warfare, by Jomini in his *Art of War*, by General Kiggell in the revised edition of Hamley's *Operations of War*, and by many other authorities at home and abroad.

The object of the strategist being to ensure that all available forces shall be within reach when a decisive battle takes place, it follows that no detachment from the main force can be justified unless it induces the enemy to make stronger detachments. If by detaching a brigade we can only induce the enemy to detach a battalion, then our plan has failed strategically. If the enemy detaches a brigade, no advantage results to either side. If he detaches a larger force, then

we have achieved success. The time question is as important here as it is in all questions of strategy; the force which the enemy detaches must be kept away until the issue of the main battle has been decided. All this shows us the difficulty of the problem which must be faced by the strategist who desires to employ detached forces, but he may be so placed that he cannot expect superiority in battle unless he, somehow or other, induces his enemy to separate the armies which have been concentrated.

Detachments designed to induce separation must almost invariably have some offensive purpose in view, they must move against some definite objective. Detachments for defensive purposes usually seek the aid of fortification to enable them to hold their own, and can best be dealt with under the heading of fortification.¹ Amongst the methods of using detachments offensively to induce the enemy to separate his forces, we may mention raids on territory, especially upon densely populated industrial centres, movements on the hostile capital, and raids on an enemy's lines of communication, especially if well timed with regard to the main battle; in fact any procedure which will induce a weak government to give way to popular clamour, always on the side of dispersion of force to guard every individual interest. The essential condition is that the enemy should be induced to

¹ See chapter vii.

detach forces that are stronger than those that we employ, which should therefore be as weak as we can possibly make them. Success will depend upon psychological conditions which it will be difficult to prophesy in the usual fog of war, and strategical detachments can be justified only by success. To mystify and to 'bluff' the enemy is essential to the success of a detached force in fulfilling its mission, and this calls for very special qualities in the leader, and the highest mobility and marching power in his troops. The usual, and perhaps the best, historical example of success in such operations was the employment of Stonewall Jackson's force in the Shenandoah Valley. By constant movement, and by fighting at the right time and in the right place, he succeeded in keeping large armies of Federals away from the decisive battles to cover Richmond; and not only this, but he succeeded in leaving these armies beyond the range of effective action when he withdrew his own force to take part in those battles. Stonewall Jackson's success was due in a great measure to his threatening Washington, and to nervousness on the part of the Federals regarding its security.

STRATEGICAL DETACHMENTS AT SEA

We can now study whether the naval strategist is likely to find any equally effective method of employing strategical detachments to induce an enemy to separate his sea forces. During our

investigation into the question of objectives, we saw that the main object of the existence of navies was to safeguard sea communication for the merchant vessels and transports of their respective countries, and to secure territory against serious and prolonged attack. Here at once we have indicated to us methods by which the use of strategical detachments can force an enemy to separate his forces (1) by attacks on trade; (2) by attacks on territory.

The former method is usually more effective, because of the result it can produce upon a hostile population. Distant territory, if lost, can be recaptured; in any case its ownership will probably depend upon the issue of the battles at sea, which settle ultimately the control of sea communications, and meanwhile the population of the home country will not be seriously inconvenienced. On the other hand, the populations of all countries are dependent upon external communications with other countries to a greater or less degree, and the chief object of the maintenance of navies is to guarantee the security of these routes. Strategical detachments directed against merchant vessels using the routes are therefore likely to be most effective in forcing an enemy to detach stronger forces for their defence, and if he does this extensively, then his main fleet may be so weakened that it may be possible to defeat it in battle. If great foresight has been exercised by him in peace time, and large re-

serves of food, and of raw material for industries, have been stored up in his country, the effect will be minimised.

There is one factor to which it is impossible to attach too much importance, when considering whether it is possible to use detachments effectively in strategy against any given country, and that is the system of government of that country. The greater the power in the hands of the people, the greater the chances of their getting their will ; the masses, as a rule, are poor strategists, and if their fears are worked upon their influence is always in the direction of dispersion of force. A sound strategical plan for hunting out the enemy, and forcing him to be so busy about his own safety that he has no time to do any damage, does not appeal to the population as a whole. The population on the east coast of North America insisted upon Commodore Schley's squadron remaining off their coast in 1898, and the merchants of London clamoured for the recall of Nelson when he concentrated his force to destroy the French fleet in the Battle of the Nile. The assurance of safety is not felt unless the protecting forces are in evidence, and forces to be in evidence everywhere must be scattered. Strategical detachments, made with the object of threatening any great national interest, are likely therefore to attain successful results ; and if a country is dependent upon sea communications, threats against these will in all probability

be effective. If armed merchant vessels are used for such threats, no strategical detachment is thereby made from the available strength in regular war vessels ; and if war vessels are sent to hunt down the armed merchant ships, then every war vessel so employed represents a dead loss in relative battle strength.

Turning now to attacks upon territory, applied with a similar object in view, we can note that attacks by purely naval forces can do little damage. They can bombard towns, of course, but much ammunition must be used to produce an appreciable effect, and the vessels employed are liable to be caught short of ammunition afterwards. For effective occupation troops must be landed. It may be, of course, that a government or a people may allow sentiment to weigh heavily in the balance, and this may cause superior naval forces to be detached, before they can be spared, for the relief of places so attacked. Lissa in 1866 is usually quoted as an example of an attack upon an outlying island being effective in drawing the Austrian fleet to its relief, but that is a not very convincing example ; the Italian fleet had been split up by Persano to attack the island from three different directions ; Tegethoff probably knew this, and took a fleeting opportunity of defeating the Italians in detail, which he would have done for whatever reason they had divided their force, whether to attack an island, or for any other purpose.

Each individual war will present its own problems, but, if recent history is a good guide to us, we find that attacks upon outlying territory were not made with the object of defeating an enemy's fleet by drawing some of his war vessels away from the decisive point ; they were usually made with a view to influencing the terms of peace. The occupation by Japan of the Pescadores Islands in 1895, and of Saghalien in 1905, are cases in point.¹

To sum up, strategical detachments at sea are likely to be very effective, provided that the population of the country against which they are made is (1) dependent upon sea communications, and (2) in a position to bring their influence to bear upon the strategists.

STRATEGICAL DETACHMENTS IN AMPHIBIOUS WAR

It is quite possible for naval forces, especially if they have an army behind them, to produce a 'containing' effect against armies on land, and history is full of such examples. The impression produced upon the Russians by the naval demonstrations against Newchuang in 1904 brought out the point most conspicuously.² It is not necessary to quote more examples, they will occur to all students of wars in which one or both sides had a long coastline to guard. For such naval demonstrations Admiral Togo used old vessels unfitted for fleet actions, and this seems

¹ See *Letters on Amphibious Wars*.

² *Ibid.*

an ideal plan, as it does not reduce the strength for battle.

Armies, skilfully handled, can also be employed to 'contain' naval forces. Against a country timid about home defence, military forces in a position to carry out raids or invasions may be able to hold excessive naval forces to the protection of the coastline. Torpedo craft will of course suffice to deal with the military forces themselves in their transports, but attention must also be paid to the naval escort of the transports, or the torpedo craft may be driven off and fail in their mission. In attempts to lure sea-going war vessels away from their proper mission of fighting against warships it would be necessary for loaded transports with strong naval escort to be in one place, and the main fleet in another. This subject is dealt with in other chapters, and needs no further reference here.

CONCLUSION

From the foregoing notes, which only touch the fringe of the subject, it will be clear that problems of extreme complication face the strategist who has to decide whether to make detachments from his main force. He will have to consider all the usual factors, the personality of his commanders, the time problem, relative strength, the influence of the opposing population on their government, and, above all, human nature. His conclusions will not be susceptible

of proof until put into practice, and he will have no justification for making any detachments at all, unless they keep hostile forces, stronger than themselves, too far away to take part in a decisive battle.

CHAPTER VI

ON LINES OF COMMUNICATION

In Land War: Historical—Supplies and stores—Railways and roads—Effect on strategy—Waterways—Marengo campaign—Waterloo—*In Sea War:* Requirements—Narrow straits—*Amphibious War:* Island and peninsula—Liao Tung—Fleets and armies—Conclusions.

THE term 'Lines of Communication' is here used in its technical sense in strategy. It is well understood in land war, but only during recent years has the expression been freely applied to war on the sea. In this chapter we will endeavour to formulate some sort of comparison between the lines of communication of armies and fleets respectively.

LINES OF COMMUNICATION IN LAND WAR

Let us for a moment imagine a strategist drawing up a plan for using an army in a country without supplies, forage, or water. In such circumstances it would be necessary to arrange that every day food and water should be supplied for each man, and forage and water for each horse, and even then the men would find great difficulty in cooking their food, unless they could find some sort of fuel in the country they passed over. Every 10,000 men would require about 60 tons of food and water per day, every 10,000

horses about 540 tons per day. These figures do not allow for replenishment of ammunition, equipment, clothing, boots, medical stores, and other similar needs, nor do they allow for blankets or for tents. The importance of not looking upon armies as counters, or upon strategy as an art cognate to geometry, becomes at once apparent when examining these figures.

The point is still further impressed if we consider how to get these weights daily to the army. If we use transport animals for the purpose, then these animals must be fed, and we soon arrive at the limit of the strength of the forces that can be employed in such a country, and the distances over which they can be moved. Take mules, for instance, as examples of transport animals. They carry about 160 lb. loads on their backs, and require a grain ration when in hard work. If they are sent on a twenty days' continuous march in a grazing country they can carry only grain for themselves, and nothing at all for the army; at the end of the twenty days they will have no grain left, and will soon be unfit for hard work. If there is no grazing they will starve, and if there is no water they cannot be used at all for such a march.

Water is really the most important factor, but though the conditions will be more favourable there will still be a serious problem to be faced in a country with water but without supplies. A daily supply of necessities must somehow be

sent to the army, and for this purpose roads, railways, or water transport must be employed. These form the communications in land strategy.

In the extreme case that we considered, in a country without resources, an army would be as dependent upon lines of communication as a diver while under water is dependent upon his air-pipe. If a hostile force established itself between such an army and its base of supply for a long enough period to cut off supplies, there would be no alternative but to break up and make the best terms possible without the issue being decided in battle. Hamley writes on this point: 'Armies are not like fencers in an arena, who may shift their ground to all points of the compass. The most impractical general *feels* this at once on taking command in a district where his troops are no longer supplied by routine; or, if he does not, the loss of a single meal to his army would sufficiently impress it on him. While distant spectators imagine him to be intent only on striking or parrying a blow, he probably directs many glances, many anxious thoughts, to the communications in his rear. Perhaps no situation is more pitiable than that of a commander who has allowed an enemy to sever his communications. He sees the end of his resources at hand, but not the means to replenish them. Is he to spread his troops to find subsistence for themselves? How then shall they be assembled to meet the enemy? Shall he

combine them for a desperate attack? How, if that attack fails, are they to be fed? He will then have no alternative but to make the best terms he can, or see his army dissolved like snow.'

A barren country affords an extreme case of the importance of lines of communication, but wars are seldom conducted on a large scale in such countries; there are usually local resources upon which an army can draw to help its strategic movements. In order to deal with this important aspect of the question, it is desirable for our purpose to consider briefly the conditions of land warfare since about the time of Frederick the Great.¹ In the period immediately preceding the wars in which he took such a conspicuous part, armies depended to a great extent for the power of movement upon systematic devastation of the countries through which they passed. For this to be possible on a large scale it was necessary to scatter over a large area, and such a system could not remain effective in the immediate neighbourhood of a well-disciplined and concentrated hostile army at all times ready for battle. Thus, by a rigid system of discipline, and by the collection of supplies in magazines and depôts along the line of march, the best armies of the eighteenth century were able to dominate opponents with a less efficient organisation. The chief weakness of the new system was that it was cumbrous, because the armies were accompanied

¹ See Hamley, *Operations of War*.

from the outset by large convoys of wagons carrying their immediate needs, they were incapable of subdivision, and little elasticity was permitted in any plan of campaign. The armies were tethered to the magazines, and could only move slowly and in certain directions which could be accurately foretold. The lines of communication had become of dominating importance, but when both combatants were tied to the same system the power of manoeuvre against such communications was much restricted, and the system has been accurately described as ultra-methodical. Supplies for the first operations were taken with the troops from their own country, and subsequent movements depended chiefly upon the collection in large magazines of more supplies, which were afterwards transported to the armies. It was upon this system that military strategy depended until the time of the French Revolution.

The armies of the Republic were confronted with the problem of making war, having men as their principal asset; they were deficient in equipment, in transport, and in resources for the accumulation of supplies in large magazines before the opening movements of a campaign. They resorted to a different system of requisitioning. Instead of taking with them all the supplies required for the first movement, they began at once to live upon the country passed through. Their armies could be dispersed in divisions

without loss of organisation or discipline, and assembled again as armies whenever battle was imminent; the soldiers were masters of the art of living on the country, and were commanded by a genius in the art of war. 'An army, no longer itself an integer, was resolved into divisions each complete in itself in all arms, and capable of either fighting alone, or of taking its place readily in battle.'¹

Instead of waiting for the collection of necessities by supply services behind the armies, the troops at once seized for themselves, on invading their enemy's country, all that they wanted for daily consumption, while behind the army the supply services collected in magazines or depôts all that they could obtain from wider areas, untouched by the leading troops. This system of 'making war support war' has lasted until the present day. It depends for success upon trusting the troops to obtain supplies for themselves in the first instance, and for this to be possible a good system is needed, both for taking what is required, and for prompt payment of compensation.²

If armies were never obliged to concentrate, if they always marched through rich agricultural countries where food-stuffs are produced, and if they never halted to rest or to fight battles, it

¹ Hamley, *Operations of War*.

² A full description of the German system will be found in Prince Kraft's *Letters on Strategy*, part i. pp. 134-9, and part ii. pp. 331-40. Wolseley Series Translation.

is conceivable that, from the point of view of supplies, they might be almost independent of lines of communication under the modern system. Unfortunately these conditions do not obtain in land war. Large armies are obliged to concentrate when close to the enemy, marches are not always through richly supplied areas, and movement cannot be perpetually sustained. Not only have supplies to be considered, but also ammunition, of which a constantly increasing amount must be sent forward with every improvement in the rapidity of fire from guns and rifles.

Lines of communication therefore are still vital to armies, and we are now in a position to consider their nature under present-day conditions in greater detail. We will look upon them as channels through which streams are constantly flowing in both directions. Forwards, towards the field armies, will be passing constantly whatever these armies may require to sustain their strategic movements, or to conduct the battles in which such movements must culminate. This will include such food, forage, and fuel as may be needed to supplement the resources of the theatre of war, especially at times when concentration for battle is necessary on account of the proximity of the hostile armies. It will also include remounts, medical stores, clothing, equipment, and boots, to replace expenditure of these important items. Then again,

experience of modern war has shown that we must expect a very high proportion of wastage from casualties, and above all from sickness, amongst the men and animals in the front line. We must therefore look upon the lines of communication also as channels, along which a stream of reinforcements must be passing constantly to the front. As regards what passes the reverse way, it is necessary to note that commanders of field armies would be seriously hampered in their movements if arrangements cannot be made to send away sick and wounded, and prisoners of war.

The picture we can now form in our minds of the line of communication leading from a base of operations to a modern army will include, therefore, dépôts of supply, hospitals, dépôts for ammunition and other vital stores, remount dépôts, and various other similar formations. As the contents of all these must be moved to and from different points, we must consider the various resources for their movement. These are—(1) Railways; (2) Roads and animal or motor transport; and (3) Waterways, such as rivers and canals, which require separate consideration. Of the first two, railways are of infinitely the greater importance for line of communication work, because of the weights that can be carried by them rapidly to long distances. Railways are so important that it is hardly conceivable that vast modern armies will be able to carry out

continuous movements for long distances without their help for forwarding requirements. It is not possible to lay down any rule regarding the maximum strength of an army which relies upon railway connections along its line of communication ; the daily requirements of an army depend upon various conditions, and so does the daily output of any given railway. If a double line, it is chiefly a question of rolling stock, of loading and unloading facilities, and of watering places for the locomotives. If a single line, the maximum distance between sidings where trains can cross each other will probably be the dominating factor. But there is one attribute common to all railways, and that is their vulnerability. On account of this, and also because it is impossible always to hug the railheads in strategical and tactical movements on a large scale, the loads have to be taken off the trains sooner or later, and sent on to the armies by road.

Where good roads are available, such as those in western Europe or the United Kingdom, motor lorries and other petrol-driven vehicles take the loads for the next stage, and usually transfer them to horsed vehicles for distribution amongst the various units of the field army. Where roads are bad, and transport is scarce, the problem of supply and distribution becomes far more difficult. Roads are far less vulnerable than railways ; little damage can be done to them excepting where they cross long bridges,

but they require to be well made to stand the heavy traffic resulting from military work.

It is a convenient place for us to note here the importance, to all students of military strategy, of working out in detail how to send the daily requirements to an army of a given strength, at a given distance from the base of operations, using various descriptions of transport. Taking the least favourable conditions, when an army moves in a barren country, devoid of supplies, and suited only to pack transport, the radius at which operations are possible is a very short one, because the limit of possibility of moving the necessary weights is very soon reached. For instance, any one who works out the details, with only pack mules available, for a force of only 20,000 men, must not be surprised to find that the number of mules required for extended operations will soon reach hundreds of thousands. Even with wheeled transport and good roads, it is surprising how much transport is required to reach an army 100 miles or so away. Unless some definite examples are worked out in detail, in order that the conditions of movement of armies in different countries shall be properly realised, the military strategist can get but little value from the study of military history. He will always have a tendency to think of the forces employed as counters on a board, rather than as armies of flesh and blood moving over real country.

If we can picture to ourselves these realities of land war, we are now in a position to consider the dominating influence of lines of communication upon military strategy. The simplest case is that presented by an army which moves straight forward, and finds railways and good roads running in the required direction. Such an army will cover its line of communication against any forces moving in the opposite direction, and the various services in rear will be undisturbed in their forwarding work. (See Diagram No. 1.)¹

Supposing, on the other hand, that our imaginary army is obliged to face to one flank or the other to meet a hostile force (see Diagram No. 2),² we see at once that defeat would be a very serious matter, and that it might lead to a complete breakdown of the line of communication services. The result might be that an army so defeated would never recover itself, especially if followed up, unless it was able to fall back upon some other base.

It will be noticed that the maximum effect is produced if an army has only one line of communication leading to some one base, which base covers only a small area. If the base should be a broad one, such as a long frontier, there will be several alternative lines leading to it, and the situation will be less acute. If there are several alternative bases in different directions, great

¹ Opposite p. 158.

² Opposite p. 158.

freedom of manœuvre is conferred on the army, but as the best examples of this are afforded in amphibious strategy, the subject will be referred to again under that heading.

Even when the enemy is far away, it is by no means a simple matter for a large army to change its direction very materially. One of the best examples of this being done successfully was when the German armies, which were moving westward, changed their direction to the northward on receipt of the news of Macmahon's movement round their northern flank. Fortunately they were marching in echelon, with the right thrown back, which must have been a great help in avoiding confusion amongst the long trains of wagons on the roads in rear. (See Diagram No. 3.)¹ Had the echelon been the other way, the troops must have crossed the congested roads, and the confusion which would have resulted can be imagined. It is easy to realise this by contemplating a change of direction to the southward, instead of to the northward, using the same diagram.

We postponed our consideration of the use of waterways for line of communication work because these vary so widely in their nature. Rivers may be navigable by large steamers, or only by small boats. Canals may be designed to cope with the immense traffic between a district like the Rhine valley and the sea, or they

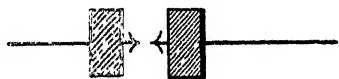
¹ Opposite p. 158.

may be small ones with numerous locks, designed to carry slow horse-barges like those which are familiar to us in some parts of England. The water-borne supplies conveyed by the Manchurian rivers had a dominating importance to the Russian armies in 1904, and the use of the Nile by Lord Wolseley, and by Lord Kitchener, in operations in the Soudan is well within our memory. A few similar examples will occur to those who study the conditions obtaining in different parts of the world, but as a rule great waterways form the boundaries between countries, and seldom lead in the direction required for use on the lines of communication of invading armies. The carrying capacity of all waterways will depend upon the floating traffic they can support, and upon the vessels available for transport; also upon facilities, such as wharfage accommodation, available for handling the loads required. Waterways as a rule are not vulnerable, excepting in the case of certain canals with frequent locks; it is therefore possible to use them in regions close to the enemy, where the use of railways would be attended with extreme risk. The use of the sea as a waterway for the supply of an army can best be dealt with when considering lines of communication in amphibious war.

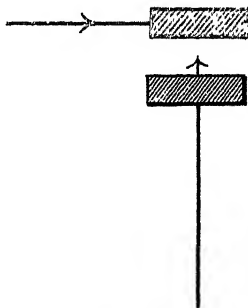
We have now studied lines of communication in land war in sufficient detail to realise their dominating importance in military strategy. It would be impossible to illustrate the points which

DIAGRAMS ILLUSTRATING LINES OF COMMUNICATION.

I.



II.



III.

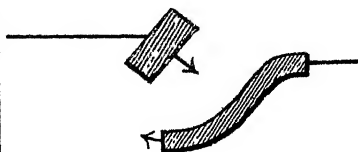
N.

W.

E.

S.

IV.



we have noted without reviewing almost every campaign which has taken place since organised armies have been employed in warfare. Not only does the direction of the lines tell in strategy, but also their length; the longer they are, the more troops must be employed to guard them against raiding forces or malicious damage, and the weaker will be the forces which are left to fight the decisive battles at the front.

If an army, which is obliged to retire after a battle, is able to do so along the line of communication, it falls back upon the supplies and reinforcements, and will probably soon be in a condition to fight again. If, on the other hand, it is driven off the lines of communication, far greater disaster results. The Russian armies in Manchuria in 1904-5 provide an example of the former condition.

It is not easy to find an example of an army being driven off its line of communication altogether by a hostile army. The cause of this is clear. Under normal conditions an enemy who attempts to manœuvre against lines of communication must usually expose himself to a counterstroke during the movement. (See Diagram No. 4.)¹

EXAMPLE OF THE CAMPAIGN OF MARENGO

Perhaps the campaign of Marengo in 1800 affords as good an example as any we can find of

¹ Opposite p. 158.

manceuvring round an enemy to sever his lines of communication, and so bring about a decisive victory. Napoleon, in May 1800, advanced into Piedmont¹ to attack the Austrian armies under Melas, which were distributed about the country. The Austrians numbered altogether about 100,000, of whom about 40,000 were besieging Genoa, or covering the siege operations against interference by a French force under Suchet, operating on the southern line. Napoleon brought about 35,000 men through the Great St. Bernard Pass to effect a junction with about 15,000 coming through the St. Gothard Pass. Melas' line of communication ran eastward to the River Mincio about Mantua. Having been deceived by a feint of only about 4000 French, through the Mont Cenis Pass, and having held on too long to the siege of Genoa, the Austrians were not concentrated in time to strike at Napoleon during his march round their flank to Milan; in fact, Melas did not realise this movement at all until the 28th of May. The general result of the preliminary movements was that Napoleon reached Milan on the 2nd of June, and the force from the St. Gothard joined him there on the 6th. Melas, on the 28th of May, ordered an assembly about Alessandria, and, by the 12th of June, had concentrated all the force he could get together at that place. By the same date the bulk of Napoleon's army was at Casteggio, with a force north of the River Po to secure his

¹ See Map III., opposite p. 162.

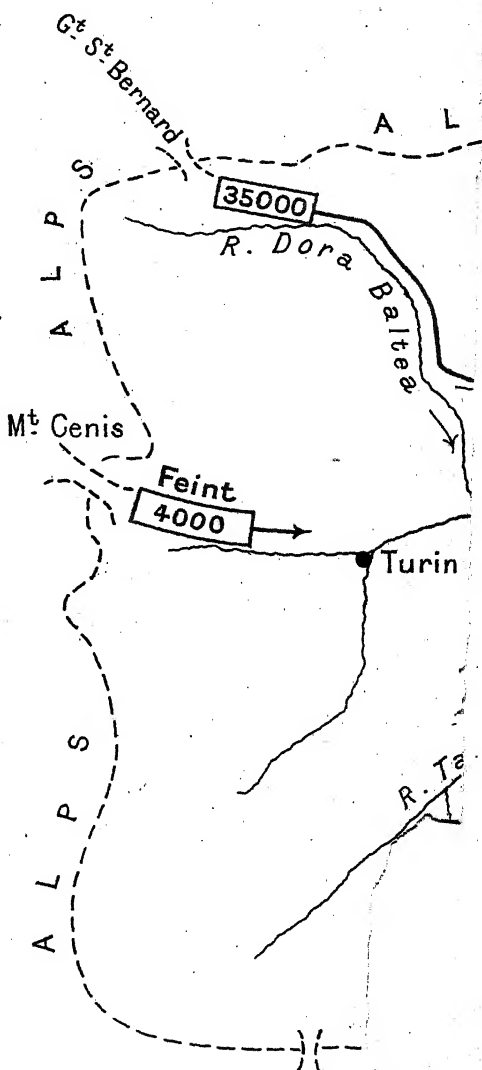
communications. On the 13th of June Napoleon crossed the River Scrivia. On the 14th of June the Austrians from Alessandria fought the battle of Marengo against him, and lost it. Being cut off from their line of communication, their defeat was decisive; Melas capitulated, and lost to Napoleon the whole of the country as far as the River Mincio.

A conspicuous feature of the campaign, if we wish to apply its lessons to modern conditions, was the lack of information on the side of the Austrians regarding the enemy's movements. It seems hardly conceivable that in these days of telegraphs, wireless communication, and aircraft, it would be possible to screen important strategical movements for so long a period; furthermore, the size of armies has increased, and what Napoleon did with 50,000 men would probably be quite impossible with 500,000; the larger an army, the slower its movements.

From our general study of the importance of lines of communication, it is not difficult to realise that the usual tendency of a defeated army is to fall back in the direction of its base of operations after a defeat, and upon this tendency Napoleon based many of his plans of campaign, including the final one which culminated in Waterloo. Counting upon this usual procedure of defeated armies, and confident of tactical success, he struck at the point of contact between the British and Prussian forces. The lines of communication of

these armies were divergent,* one running northward, the other eastward. After their defeat at Ligny on the 16th of June the Prussians retreated northward on Wavre instead of to the east or north-east, as Napoleon expected them to do. This enabled them to come down upon the right flank of the French, who were attacking the British at Waterloo two days later, and that battle settled the issue of the war and broke Napoleon's power once for all. As on many other occasions, victory was obtained by deliberate departure from strategical precedents by some strong personality. The Prussian movement was possible because they were inspired to continuous effort under abnormal conditions by Blücher, who was a leader with great personal magnetism, and the example is introduced here to illustrate the important point that, while an established military principle may furnish a useful warning, it can never be followed safely as a rigid rule.

When two armies with divergent lines of communication succeed in reaching the front and flank of a hostile army, we may here note that the direction of the communications affords facilities for gaining a decisive victory by forcing their opponents in the direction they least desire. It is not difficult to picture to oneself many similar situations to illustrate the dominating importance of lines of communication in the strategy of land warfare.



Compiled from account in Har

LINES OF COMMUNICATION IN SEA WAR

There are some who maintain that lines of communication have as dominating influence upon the strategy of fleets as they have upon the strategy of armies. With this view it is impossible to agree.

It is true that warships are not as independent of outside resources as they were in the sailing days, but although the substitution of machinery for sails has introduced great changes, fleets are still far from being affected to the extent that armies are by their lines of communication. An exception would perhaps be afforded in the case of a fleet operating in an inland sea; this case we will consider later, and meanwhile devote some attention to the normal case of operations with plenty of sea room, and free access to the oceans of the world. Compared with the soldier, who requires his daily ration, the ship requires only occasional supplies of coal or oil-fuel. An army's lines of communication are vulnerable and easily located; while those of a fleet are represented by vessels occasionally crossing the open sea by routes that can be varied at will. If these vessels once get to sea it is very difficult to intercept them, and if they commence their voyages by night it is not easy to locate them, even near their ports of departure. Then, as regards these ports, it may be that vessels carrying ammunition to a fleet will be obliged to load their cargoes in

home ports, but there is no difficulty in railing the ammunition to any of these, and if this is done an enemy attempting to intercept the vessels would be confronted with great difficulties. The same applies to coal, oil-fuel, and lubricants, which are essential to movement, but in the case of these stores an enemy has even a smaller chance of doing damage, because they can be drawn from many parts of the world. For food required by the crews, it is not essential for war-ships to communicate with the shore for several months at a time, although for the sake of health it is desirable to obtain fresh provisions occasionally. Obtaining fresh water from the shore effects a great saving in the consumption of fuel which must otherwise be expended in condensing it from sea water.

All things considered, we can conceive the possibility of a rendezvous being arranged for a fleet and its supply vessels in some position on the far side of the enemy's fleet, which is a condition almost inconceivable in land strategy. Again, we noticed that in a land battle the direction in which the two armies face with regard to their lines of communication is one of the dominating factors which affect the results to be gained by tactical success. This factor has no such influence at sea. Fleets can manoeuvre round each other 'like fencers in an arena,' a condition which, as Hamley explains, has no place in land warfare.

It might perhaps be advanced that the direction of Rojestvensky's immediate line of communication (to Vladivostok) was a factor which helped to render his defeat in the battle of Tsushima so decisive. This example does not bear upon the point we are considering. The conditions of relative efficiency of the personnel on each side, and also of the armament, protection, and mobility of the opposing fleets, prevent the deduction of any such lessons from the action. The strategical factors were that Rojestvensky was ordered to go to Vladivostok, and that he was not likely to get there without fighting the Japanese fleet, because he had to pass through narrow straits on his way to his destination. Had the fleets been equal in all respects it would not have mattered much to what point of the compass Rojestvensky's original course was directed before the tactical movements developed.

We have noted that the case of a land-locked sea requires special treatment, because fleets operating beyond narrow straits must devote special care to defending their communications, and it is desirable to consider this special case in greater detail.

Even if a fleet does not require coal and ammunition until after more than a week's steaming and fighting, and although during that period it could cover as much distance as an army could in six months, still at the end of the time it must somehow replenish. Under normal con-

ditions, coal and oil-fuel can be obtained from various directions, and not necessarily along any special line of communication that can be easily located, but the case of a fleet operating beyond a narrow strait is different. In such a case the lines of communication dominate the strategy to an even greater extent than they do for an army on land. An army with its communications cut may be in a perilous state, and may be obliged to scatter to obtain supplies, but the power of movement will not be entirely lost ; this will depend upon human endurance, and possibly upon the endurance of boots. A fleet which cannot replenish its fuel loses the power of movement altogether, and becomes helpless. Narrow seas confine supply vessels to a single route, the line of communication will be as easy to locate as a road or a railway, and equal attention must be devoted to its security. The Dardanelles and Bosphorus, and a few other similar places in the world, afford illustrations of this principle.

LINES OF COMMUNICATION IN AMPHIBIOUS WAR

In our study of strategical objectives we noticed the great and direct help that armies can sometimes give to fleets in destroying or capturing hostile war vessels which take refuge in defended harbours. The consideration which we have devoted to the influence of lines of communication upon military strategy enables us to

realise the dominating effect which naval forces can bring to bear upon land operations in certain favourable theatres of war. In the first place, by securing local command of the sea, a fleet can not only give security to an army itself during its passage, but can also safeguard that section of the military line of communication which intervenes between the army and its base in the home country. This is an aspect of the question which is of special importance to British strategists; it may be said without exaggeration that, on a large scale, there can be no British war strategy that is either purely naval, or purely military, it must always be 'amphibious' in the sense that it must consider the armies and fleets of both sides.

Let us take, for instance, this question of military lines of communication, and let us study the defensive aspect first. In dealing with the much-debated invasion problem it is essential to ascertain not only the maximum number of transports that could reach our shores, secure from naval attack during the voyage, but also the question of the lines of communication required by military forces which might be landed from those transports. What, in other words, would be the largest hostile army that could be moved about in England, cut off from all communication with its own country? For how long could it expect to fight in England without obtaining fresh supplies of ammunition from beyond the sea? These questions can be in-

vestigated in detail if the conditions of transport and supply are studied for each particular district in which the operations might take place, and the only way to come to any conclusion is to look at the problem from the enemy's point of view, and not only from one's own. When considering a defensive plan, there is always a tendency to 'make pictures' as Nelson used to say, and to attribute to an enemy powers which he would be glad to assume when making his own plans.¹

Here, again, it is necessary to devote the most careful attention to the time problem. If the line of communication of an army crosses the sea, it is important to establish a base in the country of operations, in order to be independent of oversea resources for as long a period as possible. To land the many tons of supplies and of other stores (especially ammunition, which is very heavy) must take a considerable time. Directly the landing begins, the plan can no longer be kept secret, and even if there has been no naval interference up to the time of arrival, every available war vessel, and all available aircraft, will be on the spot before long. The time required to get the necessary weights on shore is therefore of supreme importance. If the vessels carrying them are sunk before their contents have been landed, then such contents will probably be lost to the army. From our study of the dependence of military forces upon

¹ See also chapter x.

secure lines of communication, we can conceive the condition of an army with its communications with the home country severed, and the bulk of the supplies for the advanced depôt resting on the bottom of the sea.

So far we have only noted one of the methods by which naval forces can help an army defending its own country, and it will suffice under this heading to note that, given local command of the sea, a fleet can sever the lines of communication between an invading army and its own country. If on the spot in time, such a fleet will be able to prevent stores and supplies being put on shore in sufficient quantities to enable prolonged operations to be conducted successfully. This is the aspect of the question affecting our present heading, lines of communication; whether in such circumstances the invading army itself is likely to be able to cross the sea, and to land without molestation, is dealt with in another chapter.¹

Helpful as a strong fleet can be to a home defence army, the aid which it can give to an army in offensive operations is equally important, and again we will consider the question from the line of communication point of view. For the maximum amount of help to be given to an army, the theatre of operations must have a long coast-line; an island affords the greatest facilities, and, next to that, a peninsula.

¹ See chapter x.

When operating either in an island or in a peninsula, it is almost impossible to exaggerate the advantage to an army to be aided by a friendly fleet in the seas surrounding the theatre of operations. In the first place, such a situation gives great freedom to manœuvre. A large selection of lines of operations present themselves at the outset, and the base and lines of operation can be selected to produce the greatest strategical effect. When the army has moved a long way inland, and its communications become so long that defence and transport offer great difficulties, then another base can sometimes be selected and supplied from the sea; of such a case Wellington's operations in the Peninsula afford us a good example. For the Vittoria campaign in 1813 he first was supplied all the way from Lisbon, a distance of 400 miles, and as soon as the intervening country was safe he transferred his base to Santander, in the north of Spain, thus shortening his line of communication to 90 miles.

Military strategy is affected, not only by the length of lines of communication, but also, most strongly, by their direction, and local command of the sea in such cases as we are considering enables this direction to be changed almost at will; in fact an army with this advantage may be almost as free to manœuvre as a fleet at sea, if the conditions are especially favourable. Roads leading in the right direction would be necessary,

and plenty of harbours which the fleet could seize and adapt as bases for the army.

In this, as in other matters affecting the strategy of amphibious war, the Liao Tung peninsula, and the Corean peninsula, in Japan's wars against China in 1894, and against Russia in 1904, afford many illustrations of the possible application of the principle we are considering, and some of these were actually put into practice. Take, for instance, the march of Kuroki's army through Corea to the Yalu in 1904. He could not have moved his force there by land for many months if he had not followed the roads nearest to the sea on the west side of the peninsula, and if the Japanese had not secured the local command of these waters. Kuroki's army was supplied from the sea almost entirely during the most critical period of his advance ; as fast as the Japanese army could move, the navy seized harbours ahead of the main body, and supplies were landed which made continuous movement possible. The roads were abominable, and the land transport failed to keep the army supplied along the land line. Had the Russians gained the local command of the sea, Kuroki's army might have been obliged to turn back, or to have waited until the railway from Seoul caught up with his troops, and this would have meant so great a change in the time problem that the Japanese plans would have required complete revision.

Then again, as an example of the influence of local sea command upon military operations in a peninsula, let us imagine for a moment that the Russians had been in a position to send a large army to the southward into the Liao Tung peninsula to relieve Port Arthur. What would have been the position of this army if the main Japanese force succeeded in effecting a landing (say) at Newchuang, or in fact anywhere to the northward of the Russians, so as to be on their lines of communication? With only a short line to guard, the Japanese could have constantly changed their base on the coast, and every strategical advantage that can be conferred by the length or direction of communications would have been in their favour.

It is hardly too much to say that operations in a narrow peninsula are denied to an army if the local command of the sea is held by the enemy, always assuming that such an enemy also has an army. A fleet alone cannot produce the full effect; its influence on the situation is limited by the range of its guns. It is true that there are some places in the world where, without landing men, war vessels could do much damage to the lines of communication of an army. For instance, a railway line with numerous important bridges may run close to the sea, and mountains or other obstacles may be so near the coastline that no other railways can run in the required direction; if near enough to the five-fathom line,

traffic along such a railway might be made impossible by gunfire from a fleet. Parts of the line to Genoa from the south of France afford an interesting study from this point of view, and there are several other examples in the world. Even when a line of this nature is not actually within range of heavy guns from the sea, it will always be important to the army which it supplies to know that the sea is commanded by friendly vessels. Otherwise the whole line must be carefully guarded against raiding forces which might be landed, and there will be constant anxiety regarding its safety.

These examples will suffice to illustrate the importance of the aid which a navy affords to an army in connection with lines of communication. This importance is always great, but it is greatest when the geographical and hydrographical conditions are specially favourable.

As regards the help given by armies to fleets in connection with the same subject, we note that here also we find a case where the two services render each other most important assistance in their strategical movements. Defended harbours are really bases and depôts on the lines of communication of naval forces; the more of them there are, provided that they are rightly placed, the more confidently can war vessels be employed. An army which holds them for a fleet assists most effectively in naval strategy. This subject is dealt with in detail in the chapter on Fortification.

SUMMARY

To put as briefly as possible the subject of this chapter, we note from the foregoing that in land war lines of communication are of dominating importance. They also require attention in sea war, and a fleet operating beyond a narrow strait will be affected by its communications to an even greater extent than an army on land. In amphibious war, local sea command is required for successful oversea invasions; it is of vital importance to an army operating in a peninsula or an island, and may be of considerable importance for operations in any country with an accessible coastline.

CHAPTER VII

ON FORTIFICATION

Historical notes—Value in war—*Fortification in Land War*: Influence on armies—Economy of force—The temporary defensive—*Fortification in Sea War*: ‘Controlling’ the seas—Fleets in being—Containing forces—Blockships and mines—Reserves and repairs—Economy of force—Naval bases—Defence of trade—*Fortification in Amphibious War*: Tactical aspects—Mines and sapping—Safety of fleets.

WE have now reached a branch of our subject which exercises especial fascination upon many minds. At certain periods of the world's history the attack and defence of fortified places were the dominating factors in the conduct of war. Provisions were scarce, and means of communication were bad. Vast supplies of grain and other food-stuffs were collected in strongly fortified areas, in which the population attacked took refuge, while the attackers attempted to get at them. The problem of supply which presented itself to the attackers was one of extreme difficulty, and if it could not be solved for the time required to reduce the place they gradually melted away. On both sides the utmost ingenuity was exercised in the invention and use of new engines of war to enable one side to hold, and the other side to overcome, the formidable physical obstacles erected to protect the garrisons. From

the siege of Troy to that of Port Arthur the history of the world's wars is full of heroic tales of human endurance and ingenuity, displayed in attempts to defend or to cross such obstacles ; and in this, as in all operations of war, the human element has ultimately been the dominating factor.

In Bacon's words : ' Walled towns, stored arsenals and armouries, . . . ordnance, artillery, and the like : all this is but a sheep in a lion's skin, except the breed and disposition of the people be stout and warlike.'

In this connection it is essential for the strategist to take into consideration the deterioration of the fighting spirit of mobile forces which can find security behind fortifications, and this deterioration is accentuated by time. The condition applies both to fleets and to armies, it is acknowledged by historians, and it is not necessary to examine into historical examples to elucidate the point. The case of Metz, with its influence upon Bazaine's army in 1870, and the case of Port Arthur and the Russian fleet in 1904, may be taken as typical ; they are well known to all students of war, so detailed descriptions would be out of place. The condition was so well understood by the leaders of the ' stout and warlike ' Spartans that fortification of their capital city was forbidden.

Following this line of thought, fortification has been held up to opprobrium, by some writers, as a disease affecting moribund nations, and it

has even been advanced that no uses can be found for it in sound strategy. This is a much exaggerated view of the question. Fortification, properly applied, can be of great value to the mobile forces upon which the ultimate issue of a war will depend, and the realisation of this fact gives us a convenient test to apply to every individual proposal for its application in strategy. This test is the inquiry whether the proposed fortification will aid the mobile force, either on the sea or on land. If it does not do this, or if it prevents the provision of sufficient mobile forces for concentration to settle the issue by decisive battle, then the symptoms of disease appear; one sometimes reads of the 'moral' effect of fortification, 'immoral' would be a better adjective to apply if its result should be the deterioration in strength or in character of the forces which it protects.

FORTIFICATION IN LAND STRATEGY

In land warfare, there are some who hold that it is a mistake to have any fortresses at all, because even the smallest of them require garrisons of men who could otherwise be in the field army. This, as Napoleon pointed out, is going too far. It can only be advanced by theorists who count a man as a man in war, without considering the different classes of men, and the different uses to which they can suitably be put. For the field army, marching powers are required, and the ability to endure exposure and hardships.

If only men suitable for such work were employed in war, no use would be made of the older men who have had a military training, nor of the partly trained forces which require some months to mature before they can be counted as efficient field troops ; there would therefore be a wastage of the manhood of the country, able and willing to undertake the more sedentary war duties, but unfitted for the strenuous life in the mobile field armies. Of these men good use can be made in garrison work, and if the fortifications which protect them are so placed that they help the strategy of the field armies, it would be wasting power to ignore them, provided that, by the aid of such fortifications, they can be of some practical value.

The most conspicuous advantage conferred by fortifications is that they enable forces that are inferior in numbers, in training, or even in *moral*, to hold out successfully for a long time against stronger forces.

An old text-book of the British army on Permanent Fortification laid down four uses for its employment. One of these was to deny to a hostile army certain lines of advance, and this was the only one which had a direct influence upon the movements of a hostile army, and therefore the most important influence upon strategy. Dependent as armies are upon roads and railways for their advance, it is clear that fortresses placed astride these have considerable and direct delaying power upon movement.

They must either be captured, or forces must be left behind to watch, or even to surround, their garrisons, to secure the lines of communication of an army that decides to continue its advance. Where serious obstacles, such as mountain ranges, rivers, or marshes, lie across the line of advance, the roads must converge to the crossing places, mountain passes, bridges, causeways, or whatever they may be. Forts placed at such points of convergence are especially effective. Quite recently, we have seen the effect of the fortress of Adrianople upon the advance of the Bulgarian armies into Turkey, and it is a matter of conjecture whether the issue of the war would have been the same if there had been a similar fortress at Kirk Kilisseh, to delay the Bulgarians until the Turkish forces could be concentrated to oppose their advance.

The power of prolonged resistance which it gives to forces which are inferior in numbers, or for any other reason, to their enemies, makes fortification of especial importance to strategical 'detachments' which have some defensive mission to fulfil, and such fortification may either take the form of permanent forts, built in time of peace, or of temporary works, constructed when and where they may be required. As long as an army is dependent upon lines of communication for a constant stream of supplies and reinforcements, it will be forced to take some measures to safeguard the depôts, and, in order to minimise

the numbers of men deputed to guard them, it is possible to call in the aid of fortification. Then again, we have seen that in land strategy it is sometimes possible for a general to force his enemy's army to conform to his movements, by threatening the capital city, or some other objective of vital importance to the population. If these are defended, such opportunities do not present themselves to the same extent.

In all these cases we see that fortification may be of value to the military strategist without directly obstructing the movements of the enemy's main army. To take another example, the initial mobilisation of the units of an army in these days is an operation of somewhat delicate and vulnerable nature; any delay may result in danger, and even in loss of the initiative. For mobilisation great magazines of supplies and equipment are collected; for the movement of reservists, and perhaps for subsequent movements of units, railways and telegraphs are all-important; it may be considered necessary for this reason to guard all such vulnerable points, and here again fortification may help to minimise the forces employed in their defence. It will only be necessary to consider those within striking distance of the enemy's forces. To expend resources upon the defence of places which are secured from attack by their geographical position would be to eat into the resources required for the equipment of field armies, which would

not be in accordance with the principle of concentration of purpose, and the application of all resources to carry out that purpose.

By economies in men detached to delay the enemy, and to compel him to use up his forces to clear certain lines of advance, or by similar economies in the strength of the guards required for bases of operations, depôts of supply, capital cities, or other points which may require defence, fortification may be of great value to the strategist, and fortresses established for one or more of these reasons also furnish useful pivots for the movement of the mobile field armies. Such movements can seldom be foretold in peace time with sufficient certainty for it to be worth while to construct permanent fortresses for this purpose alone, and it is necessary to face the fact that such fortresses seem to have so great a drawing effect upon field armies; the tendency usually is for an army to enter the fortified area, and to remain there, lost, to all intents and purposes, for the decisive operations of war. It may also be possible for detachments placed to guard the flanks of an army to construct defensive works to aid them in their mission, but here we touch upon tactics rather than upon strategy.

When a field army, for some reason or other, is obliged to rest temporarily on the defensive, then defensive works and entrenched camps are sometimes employed to give it the needed security. Wellington's Lines of Torres Vedras afford a

good example. The dominating condition that must be fulfilled in such cases is that the defensive attitude must be only temporary, and used as a means of recuperation before undertaking movements, without which no strategy can lead to success. Instead of recuperating their powers, field armies which shelter for too long behind fortified positions will always deteriorate in spirit.

FORTIFICATION IN SEA STRATEGY

We can now turn our attention to the particular form of fortification which may be of strategic value to naval forces, fortification which is applied to coast defence. It is perhaps fortunate that we devoted attention to the land first, because we are now in a position to note at once the essential difference between sea and land war in this respect. We noted that the only direct influence which fortified places have on land forces is their power to deny to them certain routes of advance. Looked at from this point of view, we can say that fortification has no direct influence whatever upon the strategy of sea forces, because it cannot interfere with their movements. Fleets do not use roads and railways as armies do, and the open sea upon which they move cannot be dominated by the guns of a fortress. 'People often say,' as Mahan writes, 'that such an island or harbour will give control over such a body of water. It is an utter deplorable and ruinous

mistake,’¹ and to show how common the error is, we can quote from the same author the words, ‘ Ireland, by its geographical position, lies across and controls (*sic*) the communications of Great Britain with the outside world.’²

The error possibly takes its origin in the fact that many more books have been published, and much more has been written, upon land than upon sea war. In referring to it, we must note that there are a few exceptional places in the world where the sea is so narrow that the guns of forts on the coast can bring their fire to bear upon the channel for heavy ships; the Dardanelles and Bosphorus afford the best examples. The strategical use of fortification in such places depends upon the nature, extent, and importance of the seas into which they lead. To sea canals fortifications can be most effectively applied. The Kiel Canal is one of them, but this is defended in order to protect it for the use of German fleets, rather than to deny its use to the fleet of an enemy. The Suez Canal cannot be fortified on account of international agreements. The Panama Canal is to be strongly defended, and affords by far the most important example in the world of the direct influence of fortification upon the movement of naval forces, and therefore of its direct value in sea strategy.

To illustrate the important indirect value of

¹ *The Interest of America in Sea Power*, p. 53.

² *Prospect and Retrospect*, p. 100.

fortification to the naval strategist, we cannot do better than refer again to the writings of Admiral Mahan: 'Control of a maritime region is ensured primarily by a navy, and secondarily by positions, suitably chosen and spaced from one another, upon which as bases the navy rests, and from which it can exert its strength,'¹ and, later on in the same book, 'In a naval war, coast defence is the defensive factor, the navy the offensive. Coast defence, when adequate, assures the naval commander-in-chief that his base of operations—the dockyards and coal depôts—is secure. It also relieves him and his Government, by the protection of commercial centres, from the necessity of considering them, and so leaves the offensive arm perfectly free.'² These definitions are of great value, but they do not claim to exhaust the subject of the strategic value of coast fortification to a navy.

One very important function, performed by defended harbours for naval forces, is to afford them security from stronger hostile forces until a more favourable opportunity presents itself for engagement. The expression 'fleet in being' has been employed by some writers to describe an inferior fleet which by these or other means avoids serious action, and awaits a better opportunity, but the objection to this phrase is that its meaning has never been properly defined, or rather it has been defined, but differently by

¹ *The Interest of America in Sea Power*, p. 102.

² *Ibid.*, p. 194.

different writers, and if we introduce into strategy a term which conveys different meanings to different minds, confusion of thought is certain to follow. The practice of temporarily avoiding serious action, by sheltering in a fortress, or by other means, is well understood in both land and sea war, and in all cases it is realised that such action must be temporary if success is to be expected. If forces shelter permanently they not only deteriorate in spirit, but, from the strategical point of view, they might as well be non-existent. Both fleets and armies, simply by their existence, may for a time produce a moral effect upon their opponents, but sooner or later it becomes clear to all that their existence alone produces no material effect, it is a question of the uses to which they are put. We noticed the case of Wellington's army which took shelter behind the lines of Torres Vedras to await a more favourable opportunity of offensive action against the French armies in Spain. It does not seem to make the point any clearer if the words 'army in being' were to be employed in that case, and expressions of this nature tend to lend an air of mystery to what is really quite a simple condition of strategy.

Let us note, then, that fortification lends to a fleet, or to any naval force, the power to avoid action until a favourable opportunity presents itself. Most effective use is sometimes made of this fact in sea strategy. The object of a navy

being to secure control of sea communications, it is clear that under certain conditions it may be essential to keep touch with hostile war vessels sheltering in defended harbours. It is further possible that these war vessels may be so placed geographically that, if allowed to escape, they would be able to do such damage as vitally to affect the issue of a war ; they might work serious havoc amongst merchant shipping, or they might sink a whole convoy of transports full of troops. In these circumstances it may be essential not only to watch them, but to bring them to action against stronger forces. War vessels of the present day depend to so great an extent upon machinery and fuel for movement, and upon docking for maintenance of their best speed, that the fleet in harbour may be actually improving some of the material appliances, while a fleet waiting for them at sea may be deteriorating in this respect. In the old days the crews of the outside fleet improved in seamanship, and therefore in manœuvring power, while those in harbour deteriorated. This will probably still hold good, but not quite to the same extent as in the sailing days. Furthermore, sailing ships in harbour could only come out if the wind was favourable, and, knowing this, the fleet at sea could relax their watch during periods when this condition was not fulfilled.

Arrangements must be made, under present-day conditions, to provide for sending ships into

harbour for various minor repairs, and possibly for docking. If, then, it should be essential to make such provision that all hostile fleets and war vessels shall meet even equal forces as soon as they put to sea, larger forces must be used for the purpose. Again, a considerable surplus is required to allow for replenishment of coal and oil-fuel. The ships at sea will be using up these stores, those in harbour will not. Some of the outside ships must always for this reason be away, coaling, or oiling, or both.

This brings us at once to a definite effect which can be produced by fortification upon naval strategy. In some circumstances inferior naval forces, by sheltering in defended harbours, can ‘contain’ hostile forces of superior strength, that is to say, hold them off from the decisive point. Great superiority in numbers as well as in individual strength is required by a navy which must at all times be ready to dominate all hostile war vessels sheltering in defended harbours, and at the same time to concentrate a superior force in readiness to meet the enemy’s main fleet in battle.

Here we must notice other methods of dealing with war vessels sheltering in defended harbours, without the expenditure of sufficient naval force to ensure their immediate defeat at sea. Instead of always being ready to meet them at sea, and distributing fleets accordingly, it is possible under certain conditions to delay their issue. This can

be done, either by strewing the exit from the harbour with mines, or by employing blockships, if the deep-water channel is narrow enough. There are difficulties in both methods. Mines are much affected by tides, and a channel can be cleared through them by sweeping for them, and by other methods. In spite of the number of mines strewn outside Port Arthur by the Japanese, the Russian fleet succeeded in coming out on several occasions, notably on the 10th of August 1904. Blockships, as we have seen, are only applicable to narrow channels, and if the attempt to employ them is made in clear weather, they may be sunk by batteries, mines, or torpedoes, before they have effected their purpose, and if the operation is conducted by night the difficulty of their navigation to the right spot is considerable. Of late years, perhaps, Lieutenant Hobson's exploit with the *Merrimac* at Santiago in 1898, and Togo's attempts to close Port Arthur, are the best-known cases; the latter were partially successful in delaying the egress of the Russian war vessels. As it is manifestly most important for the stronger fleet to get their enemies to sea, and sink them once for all, the strategic policy of sealing them up in harbour must be exceptional for the stronger side, though it may be good strategy for the weaker. As a rule, it is only resorted to on special occasions, such as when many transports are at sea full of troops, or when some

important trade convoy is passing in the neighbourhood.

We can now examine in detail into further aspects of fortification as a factor in naval war, following the sequence of Mahan's list of the various functions which it can perform.

Fortification can assure a naval commander-in-chief that his base of operations—the dock-yards and dépôts of fuel—is secure. Here we must note the fact that war vessels depend for movement upon coal and oil-fuel. It is true that these can be sent to them in colliers and in tank vessels or oilers, but these vessels have to obtain their supplies from somewhere, and it is usual to keep a certain amount ready for immediate use at naval bases. The proportion of reserves to expenditure must depend upon the next supply obtainable; whether this is in the home country, or drawn from foreign resources, and whether plenty of colliers and oilers are available for transport purposes. As no strategical plan can be carried out without movement, and as the power of movement can be seriously interfered with by an enemy who succeeds in seizing or destroying the reserves which have been stored up, it is necessary to take such measures as will prevent him from doing so. If the harbours where the reserves are stored are not fortified it will be necessary to detach a larger proportion of war vessels for their protection, instead of only torpedo craft, which can be withdrawn to help

in a fleet action when necessity arises ; fortifications and their garrisons therefore economise naval force, and enable an admiral to concentrate a larger proportion of his resources for battle.

It is also necessary to consider the defence, by the same methods, of reserves of ammunition. Requirements will, of course, depend upon expenditure, resulting from contact with the enemy, and it is important to have reserves suitably distributed for replenishment. For most of their other stores, and for supplies, war vessels are independent for months at a time, but special attention must be paid to lubricants, without which movement cannot be sustained, and to fresh water. Whatever the nature of the reserves may be, it will be necessary to make some provision for the defence of those that are essential for movement or for battle, and by resorting to fortification for protection it may be possible to economise in naval force.

We have left to the last another aspect of naval war which was especially conspicuous in the Russo-Japanese conflict ten years ago. This is the great advantage, in a prolonged struggle, possessed by the side having the best facilities for repairing the ships which are damaged. Such damage may occur in action, from mines at other times, or from accidents not directly caused by the enemy. The damages sustained by the Russian ships while practising manœuvres at sea afford an example of the last-mentioned contin-

gency. There is a certain school of strategists who hold that a naval war will be speedily settled by great naval actions, like the battle of Tsushima, in which one side will sink or capture practically all the important warships of their enemy; but this view is not generally accepted. The assumption is that, during the course of a war, many vessels will require repairs to fit them to take their place again in the active operations, and for this to be possible it is necessary to have dry docks of various natures, workshops, and appliances for repair. In a prolonged war dry docks may also be used to clean the bottoms of ships that can be spared for the purpose, in order to avoid the reduction of speed that results if they remain constantly at sea. The defence of such repairing facilities also requires consideration, and here again fortification may help to economise in naval force. Not only for the repairing facilities themselves will defences be wanted, but also, more especially, for the war vessels using them; to these we may add the warships which are approaching completion on the building slips, and those which have been launched, in fact all vessels that can be completed in time to settle the issue of the war, or the attitude of neutrals afterwards.

Following the line of thought sketched out by Mahan, we have now studied the application of fortification to the defence of harbours and bases for a fleet, and it is only necessary here to recall

the fact that fleets are manned by men, and that the endurance of men wears out before the endurance of machinery and material. In these days of constant look-out for enemies in the air, as well as on and below the surface of the sea, it is essential for an admiral to pay attention to the mental, physical, and nerve strain on the personnel while at sea in the neighbourhood of hostile forces. The constant reports and messages which now can come in from long distances by wireless telegraphy add enormously to the strain upon the leaders themselves. Defended harbours give to the crews of fleets, of destroyers, of submarines, and of small craft of all sorts, the opportunity of occasional spells of rest from their most strenuous duties. Such harbours also afford protection to war vessels at anchor when taking in fuel from colliers or from lighters. During this process they are particularly vulnerable, because of the difficulty of manning the armament due to the whole crew being strenuously engaged, and, in some ships, to the dismantlement of resources required for action, in order to expedite the coaling.

Finally, 'Coast defence,' writes Mahan, 'when adequate, . . . relieves the naval commander-in-chief and his Government, by the protection afforded to the commercial centres, from the necessity of considering them, and so leaves the offensive arm perfectly free' (see above). It would be indeed well for the naval strategist if

this were all that need be said upon the subject. It will doubtless be some advantage that mercantile harbours, and their wharves, warehouses, and appliances, should be secured by fortifications, but, in the words of Lord Carnarvon's Royal Commission on Coaling Stations and Commerce : ' It is the movement of commerce upon the sea in war, not its security in port that is essential.' This movement cannot be ensured by fortification. Nevertheless, although it has its limitations, we have seen that in sea war, as in land war, great use may be made of fortification to aid the strategy of the mobile forces.

FORTIFICATION IN AMPHIBIOUS STRATEGY

There remains the question of the application of fortification in amphibious strategy. When studying objectives, we saw that under certain conditions it is possible for armies to help fleets to destroy the war vessels of the enemy, and for fleets to help armies against an enemy's land forces. It is only necessary for us to note here that both fleets and armies, when attacked by overwhelmingly stronger forces, can gain from fortified places the temporary security which they may need.

CONCLUDING NOTE ON THE TACTICAL ASPECT OF THE SUBJECT

Time being the dominating factor in strategical calculations, we have seen that the chief advantage

conferred by fortification is that it enables inferior forces to hold out for a time, with various objects in view, against forces more powerful than themselves. The actual methods by which they do this may be looked upon as tactical, rather than as strategical operations, but time affects strategy to so great an extent that it is necessary to consider how the period of delay is likely to be affected by modern inventions. The original idea of a fortification was some great physical obstacle between the two forces which offered great difficulties to movement. The attackers devised ladders, battering rams, and other appliances to aid them in surmounting the obstacle, the defenders employed short range weapons, from boiling oil to battle-axes, to repel the assaults. Slings and catapults increased the ranges at which damage could be done, and ultimately gunpowder and other propellants were introduced, until we have at last reached a stage when it is possible to do more damage at several miles' range than could in the old days be done at a similar number of yards.

At one stage in the process of development it became impossible to advance over the surface of the ground in face of the deadly weapons employed by the defenders, and to meet this difficulty a regular system of approaching by open trenches and by mining galleries was introduced. These had to be met by similar methods

on the part of the defenders, and the decisive issue was settled in a great measure below the surface of the ground in dispute. Owing to improvements in ordnance, it was soon found that the importance of great physical obstacles such as walls and steep earthworks was much discounted. They were conspicuous and vulnerable at long ranges, and it was difficult to ensure that they should give no shelter to the attackers from the defenders' rifle fire. Fire effect became the dominating factor, the works were made low and inconspicuous, and obstacles like wire entanglements, which give no cover, were substituted for walls and revetments; the deadliness of fire effect still made assault an almost hopeless task, and approach by deep trenches, or by mining below the surface, still afforded the only method of advance.

Broadly speaking, then, we can say that strongly fortified positions have hitherto enabled weak forces to gain much time, and that they have even forced the attackers to burrow in the ground, a very slow method of advance. The question for the future is whether, instead of trying to cross the fire-swept zone by this method, it will be possible for considerable numbers of the attackers to rise into the air, and by that method to overcome the difficulties with which they are confronted on the earth's surface. If by aeroplanes and airships it is possible to attack from the sky, then the delaying powers conferred

by fortification upon weak forces in strategy may be much reduced.

In the case of certain objectives in sea war, such as a fleet in a defended harbour, we have seen that certain areas of water can be so secured by coast defences as to render them practically safe for war vessels using them as anchorages. It has usually been necessary to employ armies in siege operations or other forms of land attack in order to capture or destroy such war vessels, or force them to put to sea. In this case, as in that of inland fortresses, it is possible that air attacks will in the future be effective ; if so, the strategical advantages conferred by fortification will to a great extent be lost, unless the local command of the air can be secured by friendly aircraft.

CHAPTER VIII

ON COAST DEFENCE

Expert advice—*What to Defend*: Defence of coast towns—*Against what to Defend*: Factors to consider—Relative naval strength—Natures of attack—Land attacks—*How to Defend*: Against torpedo craft—Mines—Forts *v.* ships—Bombardments—Running past batteries—Submarine mines—Aircraft—Nature and scale of defence—*Coastal Attacks*: Information required—*Mobile Coast Defence*: Control—Nature—Localisation—Naval policy—Co-operation.

IN the last chapter we reviewed briefly the strategic functions performed by fortification in land, sea, and ‘amphibious’ wars; in this chapter it is proposed to devote further attention to fortification as applied to coastal defence, and we shall approach the subject from the point of view of the ordinary student, rather than from that of the technical expert.

When a decision has been come to for strategic reasons to defend some place on the coast, it is a not uncommon practice immediately to approach the expert designers of forts and guns, and to put to them the question: How can this place best be defended? Experts who take a pride in their work naturally wish the defence to be as perfect as possible, and in reply to such a vague question would naturally prepare expensive schemes calculated to provide against every conceivable form of attack, probable or improbable.

This is not the fault of the experts, but of those who provide them with insufficient data ; before approaching the question of how to defend, it is necessary first to arrive at a clear understanding with regard to two points, the first of these being what is to be defended, and the second being the form of attack against which reasonable security is to be provided.

WHAT IS TO BE DEFENDED ?

Of the various objectives requiring defence in naval warfare, to which reference was made in former chapters, we can apply the test of their uses in naval strategy as a measure of their relative importance. First among these objectives we must put war vessels themselves, because nothing can surpass them in their importance for the successful conduct of naval warfare, and, before considering the extent to which war vessels will require the shelter of a defended harbour, it is necessary to consider the geographical position of that harbour, and the conditions of relative naval strength in the neighbouring seas. It is necessary to make the point quite clear that we do not allude to total relative strength, but to local relative strength under probable conditions of naval warfare. In certain circumstances a strong naval power, though confident of ultimate victory over an opponent, could only ensure such victory by concentration of naval force, and this concentration

might have to be maintained for a considerable period; meanwhile outlying naval forces in other parts of the world might require the assistance of strongly defended harbours to enable them temporarily to avoid capture or destruction by other opponents.

We arrive at the conclusion that the naval force which is weaker in local waters is more likely than the stronger force to require the shelter of a defended harbour, but this conclusion does not exhaust the subject. The fleets and torpedo craft of the stronger side will also require some secure haven to rest their crews from the constant strain which in these days affects the conduct of operations by sea.

Apart from shelter for vessels in sea-going trim, security is also required for vessels coaling or oiling, or undergoing repairs, and the first definite object to be defended may therefore be described as a 'patch of water,' required by war vessels as an anchorage under certain conditions that we have considered.

Next in importance to the war vessels themselves come the resources for the successful conduct of the sea warfare. These were treated of at length in the last chapter, and we can summarise them here as including dockyards; depôts of fuel (coal and oil); reserves of lubricants; ammunition reserves in magazines; repairing facilities, such as privately owned docks and shipbuilding yards; war material factories of

various natures; wireless stations, and similar facilities for passing information and for exercising control. To these resources, required by the navy, we can add, in some circumstances, merchant shipping, and large accumulations of merchandise on the coast. A few years ago we heard a good deal about the necessity for defending towns on the coast against bombardment from the sea. These we purposely exclude. Demands for defences from towns on the coast are sometimes most insistent, and even a popular seaside resort was reported on one occasion to have applied for batteries to defend its hotels and bathing machines. In 1898, the population of the east coast of America raised such a clamour that the American Government was obliged to keep back a fleet that ought to have been sent elsewhere in the Spanish War, and this in spite of the fact that the American coast was heavily fortified. It would be easy for an enemy's ship, with her lights out at night, to drop shells into a coast town from a long way off, and whatever guns were mounted would be very unlikely to hit her. A town is a large stationary target, a ship is a small moving one. Shells dropped into a town in such a way do very little damage, unless an enormous weight of ammunition is used, and war vessels require all the ammunition they can procure to use against each other, or against other targets likely to affect naval operations. It should be understood, for these reasons, that

towns on the coast are not to be protected by coast defences. There may be a possibility of a demand being presented by a hostile vessel for the payment of an indemnity, on the threat of bombardment if the demand is not complied with. In such circumstances the worst possible policy would be to pay; it would be as disastrous as paying an organ-grinder in London to go away, with the prospect of thereby attracting the attention of all the other organ-grinders in the district.

Having come to a definite decision in regard to what is and what is not to be defended at the individual port we are considering, the next point to consider is the form of attack against which defence is necessary.

AGAINST WHAT TO DEFEND

The tendency on the part of a defender is always to take counsel of his fears, and to imagine every possible, instead of only reasonably probable forms of attack. The moral factor is always on the side of the attacker. If every possible form of attack is provided against, instead of only reasonably probable dangers, bearing in mind the naval situation, then coast defence becomes so elaborate and expensive that there is a probability of its eating into expenditure upon the sea-going forces that are essential to the successful conduct of war. On the other hand, if reasonably probable attacks are not provided against, and important naval objectives are left exposed

to the depredations of the weakest hostile force, then the strategy of sea-going forces is seriously hampered. It may even be that war vessels required with the sea-going fleet have to be detached for local protective duty to such an extent as to endanger the probability of success on the high seas. In estimating the nature of attack against which provision must be made, it is necessary to draw a mean between the two extremes. The authority most likely to hold the balance true is the naval strategist, rather than the expert designer of coast defences, and for this reason the naval authorities should be responsible for estimating the nature of attack against which provision should be made in each case. If defences which are so designed should fail to withstand a more formidable form of attack, then the coast defence expert must be absolved from blame.

The factors to be considered in estimating the probable nature of attack are the relative naval strength in local waters, the importance of the objective defended, and the enemy's special resources for conducting such attacks. All these factors affect the probable situation, and all three must be carefully considered to estimate the true probabilities. The first affects the chance of a hostile expedition crossing the sea, and remaining unmolested in the neighbourhood of the objective for a long enough time for the purpose to be effected. The second, the importance of the

objective, will affect the prospect of its being attacked at all, and the strength of the effort which an enemy is likely to exert. The third, the enemy's special resources, must naturally dominate the whole situation; it is essential in designing the defences to know whether they must be expected to withstand the attacks of battleships, or only of less important vessels, and, if friendly vessels form the objectives to be defended, to know what natures of torpedo craft are likely to be employed against them. The nature and radius of action of the enemy's aircraft must also be studied, and, finally, the enemy's resources in troops and merchant shipping for their transport to conduct an attack from the land side. While deprecating the formulation of anything in the way of a rigid principle of war to be followed blindly in all circumstances, it is worth our while to note that coast fortresses in the past have fallen, if they have fallen at all, to land attacks, rather than to attacks from the sea. It is necessary to make special provision against this form of attack where any such danger is to be anticipated, and the extent of such danger will be governed by the first factor, the relative naval strength in local waters. If the enemy is in a position to transport a large army with a siege train across the sea, and to maintain such a force during the siege operations, then the land front of the fortress must be made proof against a siege, and an adequate

garrison must be provided. An enemy strong enough to do this must be in possession of what may be called the command of the sea, or the control of sea communications, whichever term may be preferred, in local waters, and would therefore be able to invest the sea front of the fortress. How long he would be able to invest and besiege the land front would depend upon the prospect of a field army coming to relieve the garrison. In other circumstances, when the enemy cannot undertake such lengthy operations on account of the naval situation, it still may be open to him to send raiding forces to rush the sea batteries on the land side, or to occupy ground from which the interior of the batteries can be commanded, and so be in a position to shoot down the defending gunners, while attacking war vessels destroy the objectives defended. Adequate provision must in all cases be made to provide against this form of land attack. The crews of the Japanese destroyers employed in the first attack on the Russian ships at Port Arthur had instructions that, if their vessels should be in a sinking condition, they were to ground them, land, rush the coast batteries, and destroy the armament. From accounts subsequently published it appears that the crews of destroyers acting upon those instructions on that occasion would have had every chance of achieving their object, on account of the state of unreadiness of the garrison of the fortress.

Readiness to meet such forms of attack is therefore an essential condition to the efficiency of a coast fortress, whatever may be the strength of the armament mounted to withstand attack from the sea.

In estimating what landing forces can do, there is another most important point to be considered. Some of the objectives to which we have referred could be destroyed by long range bombardment, either from ships' guns, or from siege guns. The effectiveness of a bombardment depends almost entirely upon the possibility of spotting the fall of the shell. If a landing party can occupy any eminence from which this can be done, and the results can be communicated to the attacking ships or batteries, then the bombardment is likely to be successful. 203 Metre Hill in the Port Arthur defences is a case in point. The Japanese army had lost nearly 100,000 men before they could seize and hold that observing station, and as soon as they got it they accomplished their task at once. In designing the defence of objectives liable to damage by bombardment, it is necessary to ensure that an attacker is denied access to heights which would serve the same purpose.

Speaking generally, the nature of attack against which provision must be made will depend upon the nature of each objective defended; against some objectives, such as war vessels at anchor, attacks by torpedo craft will be most effective; against others, such as magazines or oil-fuel

tanks, bombardments may be more likely to achieve the enemy's purpose; if the object is to seize and use the harbour, land attacks directed against the batteries of the defence may be expected. If within the radius of action of hostile aircraft, arrangements must in all cases be made to meet such forms of attack.

Now that we have studied both what to defend and also the dangers against which we must defend, we are in a position to consider the third heading, 'How to defend.'

HOW TO DEFEND

Let us first consider attacks by torpedo craft, which, if successful, would produce the most disastrous effect upon the most important objectives which coast defences can protect, one's own war vessels. The conditions to be fulfilled are, to deny access to the harbour or anchorage to hostile torpedo craft, while at the same time, if possible, allowing our own war vessels to come in and out freely. These conditions are very contradictory in their nature. They can only be fulfilled satisfactorily by making a break-water across the entrance to the harbour, with a small entrance through which to admit friendly vessels, and by arranging to close this entrance against hostile torpedo craft. The method of closing must be so arranged that torpedoes cannot be discharged through the entrance at vessels in the anchorage. The expense, and the

hydrographical difficulty to provide against tides, silting up, and so on, are in most cases prohibitive. There remains the cheaper alternative of using specially designed booms to narrow the entrance channel, but these again are adaptable only to special local conditions.

Whether used in conjunction with such obstructions as we have mentioned or not, the usual method of defending the entrance against hostile torpedo craft is by means of batteries armed with quick-firing guns, assisted at night by electric searchlights. It is by night that the greatest danger is to be expected, and there are great difficulties in illuminating a channel properly by even the most powerful lights, unless such channel is very narrow. In other latitudes, with a very clear atmosphere, a war vessel has been discovered and lighted up satisfactorily by a powerful electric light beam at a range of 8000 yards. On the coast of the British islands, under the average atmospheric conditions, it is fortunate if satisfactory illumination can be assured at 2000 yards. From this it is clear that it is a matter of acute difficulty for defending gunners to distinguish between hostile and friendly torpedo craft, unless their eyes have been trained by long service at sea, and even then it is difficult. The only solution appears to be to open fire upon all torpedo craft attempting to enter by night a harbour containing war vessels at anchor and requiring protection. There may be exceptions to this

rule in the case of defended harbours intended chiefly for use as destroyer bases, but in such cases grave responsibility is thrown upon the shore gunners, and this responsibility can only be reduced if large war vessels do not claim protection in the same anchorage, at all events at night time, and if some really efficient system is designed for distinguishing friendly torpedo craft, and letting them know that they are recognised, before they attempt to enter. Besides breakwaters, booms, quick-firing guns, and electric lights, as means of keeping out hostile destroyers, a good deal was heard at one time of boat mines, but not much has been heard about them lately.

Besides the destroyer, which, as we have seen, is most deadly by night, it is necessary to consider submarines, which, because of their power of diving, may be equally dangerous by day. Their radius of action is greater than that of destroyers, so that harbours at greater distances from an enemy's bases are subject to their attacks. On the other hand, they require deep water for safe diving, and in these circumstances the local hydrographical conditions must be favourable for their effective employment inside a harbour. It is easier for them to find situations outside to lie in wait for their targets. The best form of defence against this form of attack can be rendered by aircraft, as observers at a great height have a better chance of locating them than

observers near the level of the sea. If a submarine comes to the surface, a seaplane should be able to put her out of action before there would be time to dive out of harm's way, but we require practical experience in the best method of doing so. It is possible that, by dropping a mark buoy close to the submarine, a sufficient mark could be given to the gunners of the defence to enable them to do some damage, but it would be infinitely more effective if the seaplane herself could effect the purpose by bomb or torpedo.

Breakwaters and booms are as effective in keeping out submarines as in keeping out destroyers and torpedo boats, but here we have to consider the other condition for a defended port, and that is free egress for friendly vessels. If the channel is made very narrow it is easier for an enemy to close it by blockships, which may delay all egress for a considerable period, during which the war vessels in the harbour will be lost to the naval strategist. The usual weapon for use against blockships or boom-smashers is the coast defence gun, mounted in order to sink them before they can effect their purpose.

It is also open to an adversary to lay mines outside a harbour to destroy war vessels coming in or out. Coast batteries are of some use to prevent mine-layers from coming in too close by daylight, but it will be better to defer consideration of this subject until we have finished dealing with the question of the utility of fixed defences.

After defences against attacks by torpedo craft, blockships, and boom-smashers, which are designed to affect war vessels that we are attempting to defend, we will next consider defence against sea bombardments.

Here we must be careful to keep clearly before us the definite objects in view, and the damage that can be done by bombardment to what we are proposing to defend. A clear distinction must be drawn between sinking a ship, as we must sink blockships, before they can achieve their purpose, and preventing a bombarding vessel from dropping her shells on the objectives we are defending. We must consider the conditions affecting a combat between guns on shore and guns afloat, with the proviso that the fire of the ships need not be directed against the batteries at all if their object can be obtained without doing so. This object as a rule will be to bombard something else, not to silence the batteries, unless effective bombardment of the real objectives cannot be carried out without doing so.

With these preliminaries settled, we can note that in a duel with war vessels coast defences have a good many points in their favour. Ships can be sunk and coast batteries cannot. Being made to float, the amount of protection that can be afforded to ships is limited by conditions of weight; the same limitations do not apply to coast batteries. Ships afford easy and con-

spicuous targets, guns can be mounted on shore so as to be almost invisible from the sea excepting at very close ranges ; if high angle fire is to be employed, they can be made completely invisible. Finding the exact range is very important for accurate fire ; more accurate instruments, and longer bases, can be used on shore than at sea. Observation of the fall of shell is even more important than accurate range-finding, and it is easier for the coast gunner than for the sea gunner to observe the fall of his shell. More accurate adjustments of elevation can be made on land than at sea, because spirit levels can be employed. In favour of the ship we must note that she probably knows the exact position of the battery on the chart, while the coast gunner has to locate and hit a moving target.

These are all general considerations, and their application will vary in each individual case, which must therefore be studied separately. We might make all sorts of deductions from them, such as laying down a rule that one gun of a certain calibre mounted on shore is equivalent in effectiveness to three similar guns mounted in a ship, and then we might find that an enemy attaches such vital importance to attaining his object that he is prepared to order an old ship to run ashore close to a battery, at a range where every gun in the ship would be as effective as a similar gun on land. Because most historical precedents show that sea-going ships are

disinclined to close with coast batteries, for fear of being so battered that they are useless for their proper function of fighting other ships, it is not safe to assume that an enemy would never expend old ships, of little use for sea fights, if the object to be attained was of sufficient importance.

Then again, we get the special case of batteries intended to prevent hostile ships from running past them to clear waters beyond, where they can achieve their purpose unmolested. We shall consider this case specially, and from the foregoing notes we can deduce that guns in coast defences must be looked upon as a deterrent rather than as a preventive to bombarding ships, unless the aid of other weapons can be invoked. Much will depend upon the importance of what the coast batteries defend. An enemy might take big risks if they were likely to be justified by results, but not against unimportant objectives of which the destruction would have no dominating effect upon the issue of the war; in the latter case defences strong enough to act as a deterrent may suffice, in the former case they must be strong enough to prevent the attacks succeeding.

Let us now consider the case of batteries intended to prevent a really determined enemy from running ships, which he is willing to risk, through a channel to waters beyond the batteries, so as to reach a position from which he can bring

fire to bear against some important target—say a battleship in dock, a large magazine, or a big group of oil-fuel tanks. If there were no great navigational difficulties, and if several ships came in at full speed together, then few coast defence gunners would say that they would guarantee to prevent such an operation unless a vast number of heavy guns were mounted for the purpose. It is not only a question of reducing the ships to a sinking condition by gun fire, but of actually sinking them under the batteries, because if they can run on and sink in shallow water within effective range of their targets, they might still achieve their purpose.

While gun fire alone would not suffice, it would be a different matter if the attacking ships could be struck below the water by torpedoes or by mines. In some quarters it is considered that the best adjunct to batteries, for defence of channels of this nature, is the Whitehead torpedo, discharged from the shore from positions concealed from the sea. The great advantage of locomotive torpedoes, compared with mines, is that they in no way obstruct the channel to the passage of friendly ships. In the coast defences of some countries they are discharged from submerged tubes, sometimes fixed in frames, but it is understood that only bronze torpedoes are suited to this method, because steel ones rust if kept for any length of time under water.

While we are dealing with fixed defences, we

must also refer to submarine mines. These have a very great moral effect, and sometimes also a great destructive effect. It is not necessary to go back farther than the Russo-Japanese War to realise the havoc that may be brought about by the use of submarine mines. In quoting that example, however, it is important to add that the havoc was wrought, not by observation mines connected to observing stations on shore, which is the type of mine usually employed as a part of the fixed defences of a harbour, but by contact mines dropped specially for the purpose in waters likely to be frequented by the enemy's ships. Such mines are as dangerous to friend as to foe, and they must be employed accordingly; their use can be studied better under the heading of mobile defence than under that of fixed or sedentary defence. There is no doubt about their utility under certain conditions, whatever may be the opinion formed about observation mines worked from the shore. The objection advanced against these fixed mines is that the system is an expensive one, because, like all fixed defences, they must be applied to a large number of places on the chance of their being required, while only in a very few places are they likely to be of real use. Still we must recognise that their moral effect is great; the immunity of the German harbours from attack by the greatly superior French fleet in 1870 was attributed at the time to misleading information

having been spread regarding minefields which had no real existence.

One other form of fixed defence with which we must deal is that which is required against aircraft. Anti-aircraft guns, mounted to allow of firing at very high angles, may have the effect of forcing aircraft to remain at high altitudes from which accurate bomb-dropping would be difficult. Prevention of such a danger can only be brought about by the use of mobile forces in the air, even as the prevention of bombardment by a determined enemy can only be insured by the use of mobile forces, such as destroyers and submarines, in conjunction with the coast batteries.

Before passing from the fixed defences designed to meet sea attacks to those provided against attacks by land, it is interesting to study the definition of Coast Defence used by Sir George Clarke, now Lord Sydenham, in a lecture he delivered about twenty years ago to the Naval and Military Society in Malta.¹ He pointed out the importance of considering the subject under two distinct headings : (a) the means adopted to deny certain very limited waters to an enemy's vessels, and (b) the resources—men, organisation, supplies, land fortification, temporary or permanent, available to resist the forces landed outside the zone of protected waters. It is important to keep the distinction clear in our minds.

In deciding upon the strength of garrison, and

¹ Reprinted in *Navy and the Nation*, p. 326.

the amount of permanent or temporary fortification required on the land side of a defended port, we again note the importance of basing our conclusions upon the relative naval strength in the surrounding seas. Not the total naval strength of the combatants in the world in general, but the amount of force which each is likely to be able to employ in local waters, during the period of time which must elapse before a decisive issue can be brought about at the particular defended harbour that we are considering. However strong a nation may be at sea, provision must be made against such landing forces as the enemy could employ to raid the objectives which are protected, or to shoot down the gunners of batteries which bear upon the 'patch of water' to be denied to the enemy's war vessels. If, on the other hand, a country is comparatively weak at sea in local waters, and likely to remain so for a considerable period, then it may be that such a country requires on the land side a fortified front, and garrison capable of holding out against a large army accompanied by heavy siege ordnance. In designing the batteries for such defence of a land front we have the aid of the principle that, in view of the accuracy and power of modern siege artillery it is recognised that no piece, once its position has been accurately fixed by the enemy, can long remain in action unless it has very strong armoured protection. The alternative to armour is invisibility.

An enemy in a position to conduct siege operations overseas must also be prepared to use a large enough army to cover those operations against all the military forces which could be concentrated with a view to raising the siege. In the special case of the United Kingdom, those responsible for the British strategy would be in desperate straits under conditions enabling an enemy to conduct siege operations against the land fronts of our defended ports. Ports abroad require special consideration for each case, based upon the probable naval situation in war time in the local seas.

Before leaving the subject of land attack, we must note that, between the extremes of small raids and siege operations on a large scale, we have to consider the extent to which the objectives we are defending can be damaged by land bombardments. Such bombardments are possible under favourable conditions without the land defences being taken by assault or siege. Much will depend upon the vulnerability of the objectives, and the extent to which they are afforded protection by hills or other screens. There is little doubt that the determining factor which forced the Russian Port Arthur fleet to sea on August 10th, 1904, was the bombardment by Japanese 4·7-inch guns on the preceding days. They certainly did not do much definite damage, and the effect was moral rather than material, but this was chiefly because there was no position

in possession of the Japanese from which the fall of the shell could be observed. As soon as 203 Metre Hill was in their hands, the shell from these and from the heavy 11-inch howitzers were dropped unerringly upon their targets, and here we recall the importance of denying to an enemy who attempts a bombardment from the land side all observing stations from which the fall of the shell could be observed and signalled to the batteries. Aircraft have affected this, as they have so many other operations of war, and although it might be possible to interfere with the accuracy of bomb-dropping from such craft by mounting guns to force them to fly very high, it would not be possible by any fixed defences to prevent their marking for batteries engaged in a land bombardment.

Under the heading of fixed defence we have put ordnance of all natures designed to bear upon the sea, the land, and the air; fixed apparatus for launching torpedoes for the defence of channels, electric searchlights, and submarine mines. It is a question for the navy in each country whether the relative strength and distribution of naval forces, in regard to those of prospective enemies, is likely to expose coast batteries to attacks by vessels as formidable as battleships. The whole question of expenditure upon coast defence is one of extreme complication, requiring intimate knowledge of naval strategy. There is no doubt that, with two

navies of equal strength, the admiral whose coast is heavily defended feels more free in his strategic movements than one whose bases of operation are insecure, just as the general of a field army has more confidence if his lines of communication are secure. On the other hand, no admiral would advocate an elaborate and costly system of sedentary defence which involved a reduction of his sea-going forces. It is not easy to hold the balance true, but one point is certain, and that is that the liability of coast defences on an island to attacks either on the sea or on the land front is mainly a question of relative naval strength; every reduction in relative naval strength may entail an increase in expenditure upon sedentary defences. It is essential for each nation to realise this, to calculate the cost, and to decide whether it would be more effective to provide sea forces strong enough to control the sea communications, and so not only to ensure more local security, but also to safeguard the merchant shipping on which the population may depend for their livelihood. But however strong one may be at sea, some coast defences are required, it is only a question of how strong they should be made. The necessary strength of the sea front depends upon whether it is intended as a deterrent or as a preventive to the operations of hostile war vessels; the strength of the land front depends upon the time during which it will be required to hold out against hostile military

forces landed 'outside the zone of protected waters.'

The stronger side in strategy can never succeed if an attempt is made to assume the offensive at all points simultaneously. This means division of force, and as a result weakness everywhere in face of a concentrated enemy. Concentration at the right time and in the right place is the secret of success, and for this to be effected it is necessary to be weak elsewhere, and for a time to leave important objectives open to attack by an enemy's forces. By fixed defences temporary security can be afforded to such objectives.

FIXED DEFENCES FROM THE ATTACKER'S POINT OF VIEW

In studying the subject of coast defence in the British Empire it would be a great mistake to confine our attention to the defender's point of view. In our old sea wars it was the attacker's aspect of the subject which affected our strategy most particularly, and we can only hope that we shall be in as favourable a position in this respect in the future as we were in the past. When we failed, it was generally for want of sufficiently complete information about the defences and their garrisons, and it may be of service to us to note a few headings under which information is required by an admiral and a general respectively for the successful conduct of a 'conjunct expedition.' To be properly complete, such information

must be collected beforehand, and there is every indication in the public press that nations study each other's defensive resources.

Looking at a defended harbour from the sea side, the following are amongst the points upon which it would be important to an admiral to have good information at his disposal when forming his plan of attack :

- (1) Whether vessels at anchor in the harbour are screened from view or from fire from the sea.
- (2) The exact position (on a chart) of effective targets to bombard.
- (3) Conspicuous marks on shore to enable bombarding ships to fix their positions exactly, and so obtain the range to the targets.
- (4) The exact position of the coast batteries on charts used for navigation.
- (5) The appearance of these batteries from the sea.
- (6) Their exact armament.
- (7) The protection afforded to guns and gunners by the works.
- (8) Horizontal arcs of fire.
- (9) 'Dead spaces,' due to limits of depression or elevation, or to intervening high ground.
- (10) Submarine mines, observing stations, etc.

- (11) Locomotive torpedoes, 'uncontrolled' or 'controlled.' The Whitehead is an example of the former, the Brennan of the latter.
- (12) Electric searchlights.
- (13) Booms and other obstructions.

A general engaged in such an operation would want to know :

- (1) The best landing-places in the vicinity.
- (2) How to recognise them from the sea by day and night.
- (3) The usual points about beaches or wharves for landing, forming-up places for troops, and so on.
- (4) The best routes to the objective.
- (5) Resources of the country in supplies, water, and fuel, especially water.
- (6) The land transport available.
- (7) The influence of the ground and other local conditions upon tactics, and upon the nature of the force to be employed.
- (8) The best observation stations giving a view of the harbour, and of targets for bombardment.
- (9) Defences on the land side, and their armament.
- (10) Facilities for constructing field defences, or siege works, sites for batteries, nature of the soil, facilities for bring-

ing arms and ammunition from the landing-place, etc.

- (11) Far the most important of all, the garrisons, and the prospect of their reinforcement or relief in war.

If aircraft accompany the expedition, the nature and positions of anti-aircraft guns should be known, and also the appearance from the air of the most effective targets for bombardment or bomb-dropping.

From the uses and limitations of fixed defences for the protection of objectives on the coast, and the information required by naval and military commanders before attacking them, we can now pass to the question of mobile defence.

MOBILE COAST DEFENCE

When a general is conducting the operations of a field army, it is usual for certain mobile forces to be included in the line of communication defence troops. The probability of the posts on the line of communication being attacked depends in a great measure upon the relative strength of the opposing armies in the field. The weaker army will have all it can do to hold its own, without detaching forces to attack the lines of communication of the stronger army. When the decisive battle takes place, it is of the utmost importance for both sides to draw to the scene of action all the mobile forces that they can get

to the spot. Human nature is such that those in command on the line of communication always fear attack, as they are not fully acquainted with the situation at the front, and in these circumstances they raise all the objections they can to the removal of the field forces which may have been placed at their disposal for defence purposes. This sometimes leads to difficulties between the commanders of field armies and those in command on the line of communication, and the only way to prevent trouble is to ensure that the general in command of the field army is senior to the officer in command on the lines of communication. There is no difficulty about this, as both belong to the same service.

With a coast fortress, on the other hand, the mobile sea defence in some countries is worked by one service and the land defence by another. In spite of their experience of field army strategy, the military authorities in such countries sometimes claim a deciding voice in the question whether the naval mobile defence of destroyers, submarines, etc., is to be moved away if the naval strategist requires their presence elsewhere. It is curious that this should be the case, because in all countries the greatest care is taken on the land side to prevent a fortress commander from exercising control over the mobile field forces which may be in his neighbourhood, excepting as a temporary measure during actual attack in force. We have seen that fixed defences and

sedentary garrisons are unable of themselves to ensure that some of the objectives which coast defences protect are not endangered, and the fortress commanders who are responsible for the security of such objectives naturally demand the aid of mobile forces, because without them they know that this security cannot be guaranteed. The only question at issue is whether such mobile forces—let us deal with the sea front first, and call them destroyers, submarines, mine-sweepers, and mine-layers—shall be permanently allotted in all circumstances to the local defence of particular harbours, or whether the sea strategist shall be free to move them if in his opinion they can be more effectively employed elsewhere.

Let us revert to our parallel with land warfare. The object of the military strategist is so to dispose his field armies as to bring about decisive combats, and, when he succeeds in bringing these about, the armies that take part in them cannot be too strong. He throws all the force he can into the balance, and makes no detachments that do not keep stronger hostile forces away from the field of battle. Similarly, the sea strategist may require to call to the scene of a decisive sea fight his vessels of all natures that can either affect the issue of the battle or the decisive result of a victory. Neither by land nor by sea does the strategist wish any mobile force to be permanently tied to local defence, any more than a chess-player would

appreciate some of his pieces being glued to their squares. It is necessary for this reason to stipulate, when advocating the allocation of any mobile forces to coast defence, that, if the situation should demand their removal, the power to do so should be left with the authorities responsible for the general naval strategy if they are sea-going vessels, and with those responsible for the general military strategy if they are field troops. This rule applies even to forces with restricted mobility, such as torpedo craft with a short radius of action; the power must be retained of moving them under certain conditions, and, having once apportioned them to the defence of a certain locality, it would be a mistake to keep them permanently there if the trend of the war showed that there was no prospect of the enemy's forces reaching that locality.

With these considerations clearly in view, we are now in a better position to study the mobile defence forces. Under certain local conditions, we have noted that fixed defences, unaided, may be unable to act either as a deterrent or as a preventive to hostile war vessels. In such cases, submarines by day, and destroyers or torpedo boats by night, may achieve the purpose, used in conjunction with the fixed defences. Minelayers, again, may be of great service. Admiral Togo's loss of two of his most important battle-ships off Port Arthur affords a striking example. To clear a channel for friendly vessels mine-

sweepers are an indispensable adjunct to any defended harbour which is used by war vessels as an anchorage.

If the enemy attempts a landing in the neighbourhood of the fortress, it may be that some of these naval mobile defence forces could be most effectively employed against the hostile transports. For mobile military forces the probable mission will be to watch for and delay an enemy who succeeds in landing, so that there shall be time to man the defences, and to assemble relief forces from elsewhere if the garrison is not strong enough to beat off the attack. If such mobile forces have guns or howitzers with them which can be on the spot in time, these might be employed most effectively against the hostile transports and the boats landing the enemy.

Against aircraft, again, we saw that purely sedentary defence will not suffice. The only method of meeting these craft really effectively appears to be to use aircraft to drive them off; for this to be possible, long range reconnaissance is essential, as defending aircraft could not rise in time to be of any use if they were still on the ground when they sighted their opponents.

The whole question of the allocation of mobile forces to coast defence duties, whether we are considering destroyers, submarines, mine-layers, or mine-sweepers on the sea, field troops and mobile ordnance on land, or aircraft for the sky, presents the greatest difficulty to the strategist.

As a matter of fact, practically the whole art of strategy in one of its aspects is comprised in the question of what proportion of the mobile forces should be distributed about for defensive purposes, and what proportion should be concentrated to take the offensive. We get a little help from Napoleon's views in regard to land warfare which we quoted in the previous chapter.¹ Men that are fit for long and continuous marching or fighting should be with the field armies; those capable of less sustained effort will be of value for local defence work. At sea, then, we might deduce that older types of vessels may profitably be employed locally for coast defence work, while those fit for operations in the high seas should in no case be ear-marked for purely defensive and local work. But here we are confronted with the fact that several important countries build types of vessel that have such a short fuel radius that their *métier* must necessarily be defensive, in the sense that they must be employed near their own coast, and so form the naval mobile defence of individual coast fortresses. The practice is so widespread that it must be based upon some strategical theory into which it is worth our while to examine.

Some time in the eighties, some countries decided to build swarms of torpedo boats with a short coal radius, unsuited to work in a sea way. There was great talk at the time of the proba-

¹ See p. 177.

bility that the torpedo launched from such craft would bring about a revolution in sea warfare, and that large war vessels might as well be scrapped. Those responsible for British naval policy were urged to build large numbers of similar craft. The reply was the destroyer, which still retains its full name of torpedo boat destroyer. The strategical principle upon which the policy was based was that, for the United Kingdom, it would be of no use to adopt a coast defence policy, and to undertake a large expenditure upon craft suitable only for that purpose, while leaving the high seas to the depredations of an enemy. Torpedo craft suitable for local use can be built more cheaply than ocean-going craft, and therefore the tendency is for large numbers to be built by powers which can afford to do without the control of sea communications, as long as they can protect their own coasts, and their own territorial waters. The expression 'torpedo craft' here includes both above-water and under-water vessels. Some submarines have better sea-keeping qualities and a longer fuel radius than destroyers.

We have arrived then at the following conclusion in regard to the question of mobile naval defence of coast fortresses. A power to which the control of sea communication is a vital strategical condition would be wise to devote all its available financial resources to vessels capable of offensive use in the high seas. As these

become 'obsolescent' (a popular word of recent introduction) through improvements in speed and other conditions of new vessels, they can be allotted to coastal defence, and distributed about the ports most liable to attack on account of their geographical situation, and the importance of what they contain. At the same time, it is essential for the naval strategist to retain the power to move them when required, according to the development of the war, either to other ports more liable to attack, or to some point of decisive action between the sea-going fleets. For a power not aspiring to control communications on the high seas it may be an effective and economical policy to build special vessels for local defence, and to distribute them as the mobile naval defences of individual coast fortresses.

From the subject of Coast Defence we shall stray into the domain of general naval strategy if we pursue this subject further. The point that the naval strategist must bear in mind is that by guns and fixed defences alone he cannot ensure the security of certain important objectives, especially against attacks by a determined enemy who considers that the ends he has in view justify his risking, and if necessary sacrificing, some of his older war vessels and some of his troops.

GARRISONS AND CO-OPERATION

We have arrived at a conception of a coast fortress as an organisation comprising guns,

fixed and mobile, electric searchlights, fortifications, torpedoes and apparatus for launching them, and, possibly, submarine mines. Above all, a garrison determined to hold its own and to do the greatest possible execution against such hostile forces as may be employed by sea or land to damage the objectives which are guarded. Should these objectives not be of extreme importance, we have seen that by these means alone it is possible that an enemy may be prevented from accepting the risk of damage involved by an attack, but, for efficient defence of important objectives against determined attack, the aid of mobile forces, both on the sea and in the air, is an essential condition.

In such cases the whole system will depend upon two conditions, the first of these is the personality of the fortress commander. On every page of the history of the heroic struggle by the Japanese to destroy the Russian Port Arthur fleet is written the name of Kondratenko, who was the life and soul of the defence, and whose death on the 15th of December dealt a mortal blow to the *moral* of the garrison, although he was not, in name, the actual commander. The second condition for success is the most intimate co-operation between those responsible for the conduct of the fixed and of the mobile defence, the military and the naval commanders and the subordinate personnel of both services. It is impossible to ensure this condition without

some knowledge of land warfare amongst seamen, and of sea warfare amongst soldiers.

In any country provided with both a fleet and an army as instruments of national policy, the most intimate relationship is required between the highest authorities of the naval and military services in connection with the general strategy of a war. A similar relationship must also be established between the subordinate ranks if the successful defence of a coastline is to be ensured.

CHAPTER IX

ON AIR WARFARE

Recent developments—Influence on population—Bombardments—Assumptions—Fleets and armies still dominant—*Aircraft in Sea War*: Sea strategy—Airships—Aeroplanes and seaplanes—Ranges of aircraft—Information—Destruction—*Aircraft in Land War*: Information—Destruction—*Aircraft in Amphibious War*—*Combats between Aircraft*: Fighting for information—Aeroplanes v. airships—Conclusion.

WHEN we studied the strategy of fleets and of armies we considered them specially as instruments employed to force a hostile population to give way upon some question of policy in dispute. Before either naval or military forces can be used effectively for such a purpose, we noted that they must first overcome the fleets and armies of their opponents,¹ and the methods of dealing with these forces constitute the art of strategy. Our object in this chapter will be to investigate, from the same point of view, the question whether recent developments in the art of flying compel us to study strategy in three dimensions, because the movements of armed forces are no longer confined to the surface of the earth.

In undertaking this investigation, it is important to go back to our original standpoint, and to discuss the results which the population of one

¹ *I.e.* such fleets and armies as their opponents can bring into the theatre of war.

country can produce upon the population of another country by resorting to air warfare. By so doing we shall avoid any conception of war as a sort of gladiatorial combat, in which the nations concerned have no direct personal interest beyond providing the picked combatants, and equipping them with weapons and resources for movement ; such a comparison would not be complete, unless the practice of gladiators had been to represent one faction or other of the audience, and unless those victorious in the combat had been subsequently let loose upon the spectators who belonged to the losing faction. It is true that historical examples can be quoted of conflicts between nations being settled rapidly by great sea or land battles, but the strategist who based his plans upon such a rapid result being the rule rather than the exception would be ignoring the lessons of history, which teach us that nations do not always give in so easily ; a proud nation, profoundly stirred by the justice of its cause, does not give in to an opponent unless the population can be made to feel the threat of starvation or some equally effective pressure.¹ Armies, as we have seen, have several methods of bringing about such results, such as seizing the hostile capital and centres of industry and distribution ; naval forces, fleets, and commerce destroyers, by obtaining the control of sea communications, can bring strong pressure to bear against nations

¹ In a great war.

dependent upon such communications. It remains for us to consider, from the same point of view, the existing state of affairs in regard to air forces.

We can at once set aside one of the methods of harassing a hostile population, the method of interference with their means of communication. In no country does the economic life of the people depend upon air communications as it does upon communications by sea and land, merchant ships, and railways. These latter, it is true, are liable to some extent to spasmodic attack by aircraft, but spasmodic attacks cannot be expected to bring about sufficiently strong economic pressure; it is necessary continuously to occupy the land and sea routes so effectively that the passage of food and merchandise along them becomes risky and expensive.

There remain for consideration the other methods which may be resorted to by air forces to force a hostile population to give in, and here again we can draw a comparison with armies and fleets. Armies, besides seizing and controlling communications, can occupy the hostile capital city, or large industrial centres, and so upset the national life of some countries; the operations of fleets in similar circumstances are confined to the bombardment of seaport towns, and destruction of property on the coast, a comparatively ineffective procedure, not likely to lead to decisive results.

Recent improvements in aircraft enable them

to cause considerable discomfort to the crowded inhabitants of towns in a hostile country by dropping bombs promiscuously amongst the houses. For the purpose of our investigation we cannot ignore such a possibility, although we can note that such methods of dealing with the civil population amount to a reversion to the original conception of war between savages, who adopt the effective methods of slaughter and devastation to impress their will upon their enemies. Peace conferences at The Hague, in their debates upon the conduct of war, have so far failed to bring about an understanding amongst civilised nations in regard to this matter,¹ and until some agreement has been come to, and machinery has been devised for enforcing it (an important proviso), it will be best for us to put aside sentiment and consider the question from the point of view of effectiveness, rather than of humanity.

In considering the bombardment of towns with bombs dropped from aircraft, we have examples at our disposal of the similar case of bombardment by ordinary guns. Experience tells us that a vast amount of shell must be fired to do any material damage. In the case of a defenceless town a threat of bombardment may be effective as a means of forcing the inhabitants to provide the supplies required by an army,¹ or a subsidy demanded by a fleet, but it is not easy to find

¹ The addition, at the 1907 Hague conference, of the words 'by any means whatsoever' to the article (25), which forbids the bombardment of undefended towns, is considered by some people to secure immunity.

examples of such a threat being carried out. If the town is fortified, on the other hand, bombardment is a recognised method, like investing and starving the civil population, which is employed deliberately in order to induce the inhabitants to prevail upon the garrison to surrender. Starvation, combined with bombardment, has frequently brought about this result, but bombardment alone has usually failed. The civil population can generally find safety in cellars, or in specially constructed bomb-proof shelters; the chief danger of widespread damage is that resulting from fires, which can usually be kept down without difficulty if adequate arrangements are made for the purpose. It may be assumed in these days that siege guns can drop their projectiles with considerable accuracy upon any target which has been accurately located on the map, especially if the fall of the shell can be observed; but even with the facilities afforded by railways and siege tramways to the batteries, it is difficult to get up the heavy weight of ammunition required before decisive results can be expected. The accuracy attainable by aircraft in dropping bombs still leaves much to be desired, and the question of replenishment offers greater difficulties than it does with siege batteries.

Taking all these points into consideration, if it is so difficult to reduce the crowded population of a town to subjection by bombardment from guns, it seems safe to assume that the few

hundred aircraft at present at the disposal of any military power would be unable to bring serious pressure to bear upon a hostile nation numbering many millions, spread over wide areas. The moral effect which would be produced by highly mobile aircraft dropping bombs first over one city, and a few minutes afterwards over another city a hundred miles away, would no doubt tend to produce local panics, but, given the right spirit, the material effect would not suffice to produce concerted action amongst the population to force their Government to stop the war. It would be more effective for the whole population to arm themselves with every weapon obtainable, and to exercise their marksmanship upon every hostile air vessel coming within the range of bullets. They would know that their flying enemies were few in number, and helpless if they alighted, and the question of resistance being forbidden to men wearing plain clothes would not arise; the crews of a few air vessels could not alight and hang the armed population of a countryside. When flying has been developed to such an extent that flying combatants can be counted in tens of thousands instead of in hundreds, then the issue between nations may be brought to a conclusion in the air, and the only instruments that can deal with air armies or air fleets, or whatever they may be called, will be forces as mobile as themselves. Any attempt to meet their attacks by comparatively sedentary

forces, such as batteries of guns, will be open to the objection to all sedentary defence. It must be universally distributed if it is to be effective, and prohibitive numbers of guns and of gunners are required. The only forces which can be effectively employed in strategy against aircraft which move at the rate of one hundred miles an hour are similar or superior forces, at least equal in their speed of movement.

If our assumptions regarding the existing situation are correct, then fleets and armies still remain the principal instruments at the disposal of rival powers to bring wars to a conclusion. At their present stage of development, and numerical strength, we must consider aircraft chiefly in their relationship to the operations of such fleets and armies, and to this aspect of the subject our attention will next be devoted.

It is practically impossible in this part of our investigation to adhere to the purely strategical side of the question. In the case of armies and of fleets the tactical side could be touched upon very lightly, as there are many books which treat exhaustively this branch of war, but with aircraft it is a different matter. Perhaps from the purely strategical point of view, the rate and range of movement, and the conditions upon which movement depends, are the most important points to which to devote attention, but since all strategical movements must culminate in combats of some sort, it is essential to consider what

damage aircraft can do to fleets or armies against which their strategic movements may be directed. At this stage we can follow the plan which we adopted in former chapters and consider the relationship of aircraft to other forces—(1) in Sea warfare; (2) in Land warfare; and (3) in Amphibious warfare; to cover the case of the combats likely to occur between the aircraft themselves in carrying out their mission, we must also consider (4) Combats between aircraft.

AIRCRAFT IN SEA WARFARE

Assuming that in the present stage of their development the effect of aircraft in war is to be found in their relationship to other forces, rather than in their independent action, we must next consider the capabilities of those types which can operate over the sea, and so produce an effect upon naval strategy. We must also consider the steps which can be taken to destroy them, or otherwise to nullify their effective use, and here we must realise that every few weeks we read of new developments and extensions of the functions which aircraft can perform. As their radius of action, speed, carrying power, and destructive effects are extended, their strategic functions will be extended in proportion, but it is improbable that the general principles which we can apply at the present stage will require alteration for some years, until aircraft and their trained pilots and crews are sufficiently numerous

to claim consideration as an independent arm, rather than an auxiliary to the other combatant services.

In order to work on a regular system, when considering the influence of aircraft on sea warfare, we must recall to our minds the strategical functions which are required of war vessels moving on or beneath the surface of the sea. These functions are threefold. The first is to destroy the hostile war vessels at sea, or in harbour, if this be possible. The second is to aid or prevent the passage of military forces across the sea, and, generally speaking, to help or interfere with the operations of such forces while they are landing, or after they have landed. The third function is to harass the hostile population by interrupting sea-borne trade, and at the same time to prevent similar interruption of one's own trade. The attributes of aircraft which have most influence upon their power to assist war vessels in all these functions are their speed and radius of effective action, their power of rising from land or water, and of alighting on both elements, their carrying capacity and power of doing damage, their facilities for observing and for reporting the information they obtain, and, lastly, their reliability under different conditions of weather. It is also necessary to consider the ranges at which they are vulnerable to high-angle fire directed upon them by their selected victims, in order to study whether the allotted task can

be performed without a prohibitive chance of their destruction before their mission can be fulfilled.

In all these matters there is a wide divergence between the two different classes of aircraft, those that are lighter than air, such as airships, and those that are heavier than air, such as seaplanes and aeroplanes. Airships may be of various types according to their build, the structure containing the light gas may be wholly or partially of rigid material such as light metal, or not rigid at all, and only kept distended by the pressure of the gas within. They are very clumsy to handle while on the ground, and are usually housed in large and expensive sheds, but when in the air their navigation is comparatively simple. They can lift heavy weights, which enables them to carry comparatively large crews, and armament giving them offensive power. Their lifting capacity also enables them to carry heavy bombs, and, as they are lighter than air, they have the power of hovering so as to drop the bombs with considerable accuracy. Owing to the lighter density of the atmosphere at high altitudes the height at which they can be manipulated is to some extent limited, but they have good climbing power, which can be accelerated by throwing out ballast, and also, at certain speeds, by the use of inclined planes. The ballast once lost cannot be replaced. They offer a very large surface to the wind, which renders them depen-

dent to a great extent upon weather conditions, especially near the earth's surface. They also offer a vulnerable and comparatively easy target to projectiles. Their lifting capacity and steadiness of platform afford good facilities for observers to obtain information, and to report it by wireless telegraphy, and for gunners to manipulate their weapons. They can remain in the air for long periods at a time, and this, combined with their speed, gives them a long radius of action; combined with their facilities for confident navigation, it suits them for work by night, when their extreme vulnerability is not so severe a handicap. In order to standardise our ideas as far as possible, it would be desirable to have some definite figures representing the average capability of airships in regard to these various matters, but it is impossible at the present stage to calculate any average that would not be misleading. Nevertheless, the following statistics may be of some value, chiefly for the purpose of comparison with the performances of aeroplanes and seaplanes. They have been collected chiefly from newspaper reports, magazine articles, and lectures of experts, and cannot be taken as representing the averages.

SOME PERFORMANCES BY AIRSHIPS

Weight lifted (in addition to fuel and crew),	7850 lbs.
Time spent in the air,	30 hours.
Speed attained,	51 miles an hour.

Climbing speed (measured vertically),	1500 ft. per minute.
Distance covered (without alighting),	960 miles.
Number of men carried,	28
Height attained,	9645 feet.
Range for reporting by wireless telegraphy,	300 miles.

It will, of course, be realised that all these qualities have not been combined in the same machine. Every airship, like every war vessel, represents a compromise in design, and abnormal development of one quality nearly always involves a sacrifice of some other quality. As the size of warships must be affected by the depth and area of the harbours they will use, so the size of airships is affected, if not dominated, by the difficulty of handling them near the surface of the ground. Airships at present require large numbers of men to get them out of, and into, their sheds; they rise from, and return to, their regular land bases, rather than anchor elsewhere either on land or sea, though successful experiments are reported for anchoring them by the bow, and for enabling them when so anchored to ride securely even in a strong breeze. Finally, they are costly, and take a long time to build.

Turning now to craft heavier than air, which depend entirely upon their engines for rising in that element, these, as we have seen, are aeroplanes and seaplanes, the latter being in a few

cases designed as hybrid machines to pitch either on land or on water. In some writings it has been the practice to consider seaplanes only, when dealing with sea strategy, but it is desirable to include also aircraft which start from and return to the land, especially now that so much attention is being devoted to possible operations in narrow waters such as those of the Baltic, the North Sea, the Channel, and the Mediterranean. Compared with airships, aeroplanes and seaplanes are far more portable, and they are easier to handle when on the land or the water respectively. They have no great lifting power, and, being unable to hover, they cannot drop bombs with much accuracy. Their power of climbing depends upon their speed, but, since they are raised by the power of their engines, and not by their displacement of air, they are less dependent of the density of the medium in which they move; they can therefore attain to very great heights. They are independent of the use of ballast, and can therefore fly upwards or downwards as long as their engines can be kept running. Their surfaces exposed to wind pressure are less than those of airships, so the wind has less effect upon their manipulation. They offer a very difficult target to the gunner or rifleman on the earth's surface. They do not afford as good facilities as airships to observers in obtaining information and reporting it by wireless, or to gunners in manipulating their weapons. In this connection,

however, we must note that the tendency appears to be to fit seaplanes with torpedoes to be dropped in the sea when attacking war vessels,¹ in order to inflict far more serious damage than is likely to result from bombs dropped on the deck; a bomb dropped on the deck may seriously damage the fighting power of a ship, but its effects are local, a hole below the water may sink her altogether. Aeroplanes and seaplanes cannot remain in the air as long as airships, and the former encounter great risks if they try to pitch on the ground by night. These conditions shorten their radius of air movement, but, on the other hand, their portability enables them to be carried on ships for any distance before such flights commence. It is quite possible for them to start their flight from a ship's deck, given a few simple fittings, but alighting on a ship's deck after a flight is not at present attempted. Seaplanes can cover considerable distances on the surface before rising. In conclusion, we can note that aeroplanes and seaplanes can be built more cheaply and more rapidly than airships, and, most important of all perhaps, they have a greatly superior speed. As in the case of airships, we are not yet in a position to standardise our ideas of the capabilities of aeroplanes and seaplanes by quoting averages, but the following statistics may be of some use, if it is borne in mind that they are obtained from similar sources to those quoted for

¹ Press reports of recent patents in United States.

airships, and that they are subject to the same conditions in regard to compromise in design so as to develop one quality or another to the maximum shown, at the expense of the other qualities.

SOME PERFORMANCES BY AEROPLANES AND SEAPLANES

	Aeroplanes.	Seaplanes.
Weight lifted (in addition to fuel and crew), .	1500 lbs.	..
Time spent in the air, .	16 hours.	4½ hours.
Speed attained, .	112 miles.	78 miles an hour.
Minimum speed, .	30 to 35 miles an hour.	
Climbing speed (measured vertically), .	1350 feet per minute.	
Distance covered without descending, .	1050 miles.	240 miles.
Number of men carried, .	16	4
Height attained, .	19,600 feet.	..
Range for reporting by wireless telegraphy, .	60 miles.	60 miles.

While treating the subject of aircraft it will be as well to note, in regard to their vulnerability, the actual results obtained under war conditions. We have no war experience of airships to help us ; their weight-lifting capacity makes it possible to give armoured protection to the crews, and unless inflammable gas is used, and projectiles with very sensitive fuses can be devised to set the gas on fire, the airship can only be sunk very slowly by small holes in the envelope ; the crew in the meantime would most probably be able to execute their mission of destruction or reporting

information. Seaplanes, again, have not yet been used in war. Aeroplanes were used by the French in Morocco, by the Italians in Tripoli and Cyrenaica, and by the Greeks and Bulgarians against the Turks. It appears from experience so gathered that aeroplanes, in spite of their great speed, are likely to be riddled with bullets when passing at a height of 3000 feet over hostile riflemen, but such bullets do no serious damage unless a lucky shot disables the pilot, who can easily be protected by a floor of armour plating from such risks. A hit on the material from a gun, even of only one-inch calibre, would be a different matter.

Before drawing deductions in regard to the influence of aircraft upon sea strategy we have one more point to notice in connection with atmospheric conditions, and that is the influence of mist and fog upon observation from the air. To illustrate our point it is only necessary to recall the number of occasions upon which, in these latitudes, we are prevented by fog from seeing many yards horizontally, while at the same time the sky overhead is clear. To those who are interested in the care of homing pigeons it is a fairly common experience to find that these birds can find their way to their lofts by flying high, and though they may possibly have some innate sense of direction which helps them, we know that sight has a great deal to do with it. But in any case it is clear that a thin layer of fog close to the earth's surface will limit the range

of vision along that surface far more than it will limit the range for an observer above, who looks downwards through the layer of fog. With this note we can close our investigation into the attributes of aircraft, and consider their influence on sea strategy.

The progress of science, and the pluck of the pioneers of the air, have placed at the disposal of the sea strategist engines of war that can carry combatants through the medium of the air, without alighting for distances reaching 960 miles in the case of airships, 1050 miles in the case of aeroplanes, and 240 miles in the case of seaplanes. The functions of war vessels, as we have seen, include (1) dealing with the war vessels of the enemy; (2) facilitating or preventing the employment overseas of military forces, and (3) the interference with, or protection of the sea transport of merchandise, food-stuffs, and bullion. Let us consider the influence of aircraft upon these three functions.

The war vessels of an enemy must be either at sea or in harbour; this is a very obvious truism, but it is stated to emphasise the importance of considering the two cases separately. If at sea, their whereabouts can be ascertained in several ways. One's own war vessels may be deputed to find them, and possibly to risk annihilation in obtaining the information required. Merchant vessels may have met them, and may be ready to pass on the information so obtained, or

observers on shore stations may have sighted and recognised them when passing within a few miles of a coastline in clear weather. It is unnecessary to enlarge upon the vital importance of aircraft as a substitute for the sources of information which have been mentioned, or as supplementary to them. Besides the greater range of vision from high altitudes, and the power of seeing downwards through a layer of low-lying fog, it is claimed for aircraft that their crews under favourable conditions can locate submarines, which are very difficult to find from the decks of surface vessels. An admiral with aircraft at his disposal will therefore be in a better position to locate all hostile war vessels, including submarines, which may be at sea, and no more important function could be performed in aid of strategic movements and concentrations. Then again, although the arts of dropping bombs from aircraft in general, and of launching torpedoes from seaplanes, appear to be still in the experimental stage, yet such progress has been made that it is impossible to ignore the results which may be achieved in this direction. Besides the location of hostile war vessels at sea, an admiral may find aircraft of great value to aid in their destruction.

Passing to the hostile ships in harbour, war vessels nowadays have very little chance of finding out anything about them. In the old days we read of gallant leaders like Rodney sailing

into hostile defended harbours, finding out what ships were anchored or laid up there, and sailing out again without suffering any serious damage. The torpedo, the submarine mine, and the long range heavy gun mounted inconspicuously on shore, have changed all this. War vessels can find out very little without prohibitive risks to themselves, though it is just possible that submarines, skilfully handled, may be able to scout in cases where the navigational difficulties can be surmounted. Merchant vessels are not likely to come out of such harbours, or to give much information if they do; they can only get out by escaping observation and getting away to sea at their best speed. Friendly observers on shore will not be easy to find, and will have much difficulty in getting their information out of the hostile country. There remains the press of neutral countries, and this may be a valuable though somewhat precarious source upon which to rely. These notes will suffice to show how vitally important aircraft may be to an admiral for locating the war vessels in the harbours of the hostile country.

Although the point has not for many years received the attention which its importance deserves, it is just as necessary to destroy the hostile war vessels that are in harbour as it is to destroy those that are at sea, and it will be as well for us to consider whether, having located such war vessels, it is possible for aircraft to aid

in their destruction. When we were dealing with objectives in amphibious strategy we noted the comparative helplessness of fleets in getting near their enemies sheltering in defended harbours. We noted the precedent of Port Arthur in 1904, and other examples where it was necessary to invoke the aid of an army to achieve the purpose. We saw that, if such an army can seize a good observing station from which the fall of the shot can be spotted, then, without carrying the land defences, it is possible by land bombardment so to batter the ships in harbour that they must either put to sea, or run grave risk of being sunk. It is possible that, by the use of aircraft for observers, a fleet at sea may be able to attain similar accuracy in bombarding hostile vessels in a defended harbour, and the aid of an army can be dispensed with. Such a possibility is far-reaching in its consequences; it would modify the 'containing' power of inferior naval forces in defended harbours, to which we referred in the chapters on Dispersion and on Fortification, and here again we must consider aircraft not only as observers, but also as combatants with destructive power. We must look forward to the time, which some think has already arrived, when aircraft, especially airships, will be able to destroy vessels at anchor or in dock by dropping heavy bombs upon their decks.

The operations of aircraft we have so far considered may be defined as having a direct effect

upon war vessels. We must also study the important indirect effect which they can produce. The naval strategist at every turn in his investigations is confronted with the fact that his art depends in a great measure upon material appliances; war vessels require fuel and lubricants for their movements, and ammunition for their battles; heavy guns become worn and must be replaced; all the complicated material, gun mountings, engines, torpedoes, and launching apparatus, may require repair or replacement, and the hulls themselves may be damaged and require the aid of dry docks for repair; new vessels may be approaching completion in the building yards; wireless telegraph stations are wanted for the whole system of intelligence and strategical control. We find then that a serious, though indirect, effect can be produced by the destruction of reserves of oil-fuel in tanks and ammunition in magazines. Dockgates or caissons, floating docks, machinery for gun, torpedo, and engine construction and repair, war vessels under repair or building, wireless stations, and other similar installations, all afford vulnerable targets to bombs dropped from aircraft. Although attacks upon such appliances may be called indirect, in the sense that they are not directed against the hostile war vessels themselves, yet the effect of success in such attacks might be to paralyse for a time the offensive power of a fleet, and it is essential to the strategist to consider such

possibilities, and to make such provisions as may be required for security.

Turning now to the second function required of naval forces in sea strategy, facilitating or preventing the employment of military forces across the sea, the functions of aircraft in this connection are similar to those which they can perform against war vessels. They can help to locate the transports, and also to destroy them.

For the third function, the interference with and protection of trading vessels, aircraft are better suited for protection perhaps than for attack, always supposing that some consideration for humanity and civilisation will enter into the conduct of war in regard to the treatment of civilians. On account of the smallness of their crews, aircraft could not seize merchant ships and take them to any convenient harbours against their will. They might sink with bombs or torpedoes a vessel of which the captain refused to obey instructions, but in so doing they would have no means of saving the passengers, while destroying the merchandise. Some of these passengers may be citizens of powerful neutral countries, with whose Governments it may be important to keep on good terms, and very soon the exasperation caused by such action would be acute, and every vessel travelling on the high seas would bristle with light guns to give a warm reception to all flying enemies.

But, apart from the consideration of aircraft

as instruments of destruction in connection with trade, we must note that, as in the other cases we have considered, they have the very greatest value for obtaining information. They can warn merchant vessels of the position of commerce destroyers, and they can also inform war vessels of the whereabouts of such craft.

In this case the best information will favour the stronger side, as it always does in war, and, speaking generally, we can note that the introduction of aircraft into sea warfare is all in favour of the belligerent with the stronger fleet, provided always that the numbers of aircraft at his disposal are sufficient, when compared with the numbers at the disposal of his enemy.

AIRCRAFT IN LAND WARFARE

In considering the influence of aircraft on the strategy of land forces, we need not repeat our notes upon the attributes of airships, aeroplanes, and seaplanes. We must again include all these types, since seaplanes can affect all military operations which are conducted within their radius of action; and this radius must be measured, not only from the nearest seacoast, but also from the inland waterways and lakes which afford facilities to such craft for rising into the air, or for alighting after a flight.

When we studied 'objectives' in military strategy, we came to the conclusion that an army is not likely to be in a position to force a hostile

nation to make peace on favourable terms unless the hostile army¹ can first be decisively defeated. To this aspect of the question we will now devote our attention.

Aircraft afford facilities to trained observers to climb to high altitudes, whereby they gain a range of vision which is denied to observers on the surface of the ground, and this fact will have a dominating influence upon military strategy. In previous chapters, especially that on Dispersion of force in strategy, we noted various methods by which small forces can keep larger ones away from the field of decisive battle, methods which Hamley calls the most effective weapon in the military armoury. The small forces which are employed on such missions depend almost entirely upon secrecy, they use every endeavour to mystify and mislead their opponents, and they take every advantage which the accidents of the ground afford them to conceal their real strength and dispositions. Aircraft skilfully used will change all this. Given good air scouts, the opposing generals will be able to place the forces of both sides on the map, and make their plans accordingly. We could take in detail every strategical operation, and examine into the effect which greater facilities for obtaining information will be likely to produce upon one side or the other, but the case we have quoted will suffice

¹ *I.e.* the military force that the hostile country can bring into the theatre of war.

as a typical example. Improvements in means of getting information will in each case be found to favour the stronger side, and this will apply both to strategical and to tactical situations.

Weather conditions must more than ever be studied by the military strategist, now that travelling by air has become possible. When considering the sea, we noted that in local fogs or mists, such as those prevailing in these latitudes, an observer in a seaplane, looking downwards through a low-lying bank of fog, can frequently see all that he requires, while the range of vision is very limited to an observer on the deck of a ship. On land, the topographical conditions are most important to a military strategist who has the choice of several lines of advance or retirement for forces of which he wishes to conceal the movements. River valleys and similar regions are subject to low-lying fog. Mountain tops are often obscured by cloud banks. It may perhaps be taken as a rough rule that aircraft run great risks of failing to report the information they gain if they do not keep above 3000 feet from the surface, otherwise they are likely to suffer too severely from even the rifle fire of the troops they are observing.

Another point which it is desirable to note is the difficulty of alighting on land, if there is no suitable ground for the purpose. At the present stage it seems that reporting by wireless telegraphy from the aeroplanes has not proved as satisfactory as it has from airships. Message

bags dropped from the air, when going at high speed, cannot always be relied upon to reach their destination rapidly. It is therefore the usual practice for the aeroplane to repair to the authority to whom the report is to be made, and to land the observer, who makes his report in person. For this to be possible there must be a convenient landing-place close to the intended recipient of the report, and in some countries, such as those with many fences, or with hardly any level ground, this condition presents a real difficulty. Observers in airships are not subject to the same condition, as they can report by wireless telegraphy. All such points must be considered by the military strategist, in connection with the application of the use of aircraft to special theatres of war.

We can now turn to the other attribute of aircraft, their power of destruction, of killing men and horses on the ground, and of wrecking material. We noted the extent to which sea strategy can be hampered by damage done to material, to ships themselves, to reserves of fuel and ammunition, to docks, and to machinery and appliances for construction and repair; it does not seem that land strategy can be hampered to anything like the same extent by the destruction of material, because armies are not so dependent upon material for their movements. The most destructive weapons possessed by aircraft are the bomb and the gun, the latter being of small calibre. Great accuracy in the employment of

these weapons is not to be expected at the present stage, and airships, which can hover, have the advantage over aeroplanes in this respect, but they themselves offer an easier target.

Let us now examine the various operations of land strategy leading up to decisive battles, and consider how they could be hampered by aircraft attack. Mobilisation is the first process to be considered. This involves the assembly of reservists, and the issue of clothing, equipment, transport, and ammunition, which are all accumulated beforehand in various stores and magazines at the centres of assembly. The railways required for assembly offer certain effective targets for bombs, especially where they cross long bridges or viaducts; the stores and magazines also offer effective targets, if they can be attacked before their contents have been issued. The next strategic process is the assembly of the larger units, and their movement, usually by rail if the distances are great, to the line of army concentrations. Injury to railways will be effective during this process, and the large number of troop trains which will be running will present targets for bombs. During the next stage the armies will be marching in long columns along roads, and such columns should afford fairly easy targets to aircraft, especially when the roads run straight for long distances. In such circumstances aircraft are not hampered much by their own speed in regard to the

accuracy with which they can drop their bombs, or discharge their guns; with a long straight target, extending for several miles, extreme accuracy is not required.

The long columns to which we have referred will occasionally halt and seek billets in villages, if out of reach of the enemy, or bivouacs, when coming into closer contact. Such billets or bivouacs, especially the former, will again afford fairly easy targets. It is of great importance to troops to rest when so halted, and aircraft may have an opportunity of interrupting the repose of the enemy's troops, thus depreciating their subsequent powers of marching and fighting. A dominating effect upon strategy may so be produced, and troops may be compelled to rest in woods or other cover by day and march by night. At the present stage the difficulty experienced by aeroplanes in landing in the dark has not been surmounted, so that, whether sent up to scout or to destroy, they must usually remain up all night; this may mean flying for fourteen hours with all the attendant risks of failure of engine power, shortage of fuel, and exhaustion of the personnel. Airships are apparently better suited than aeroplanes for night work. They can carry searchlights, heavy bombs, and wireless telegraph apparatus, and they bring less strain upon their crews. Seaplanes can usually alight upon the water by night,¹ so that

¹ Provided that the surface can be located.

troops operating within the radius of action of these craft will be exposed to attack by them at all times.

In regard to special targets for bombs, it is as well to note that the large armies of the present day are complicated organisations to handle in the field, both in their strategical and in their tactical movements. With the increase in the size of armies, the commander, the controlling brain of the whole organisation, has gradually been withdrawn from the somewhat disquieting surroundings of the combat itself, in order to enable him to retain a sense of proportion, and so be better able to take a general view of the situation which he is controlling, and avoid being dominated by the local incidents within his range of vision. To aid in the work of organisation he has a large staff, and a network of communications radiate from his headquarters. Such headquarters offer a tempting target to aircraft, and successful attacks upon them may produce most decisive results upon the efficient handling of an army.

Other suggestions will occur to students of the subject, such as attacks upon ammunition reserves in mobile columns, parks, or magazines, if these can be located. The influence of aircraft upon the value of fortifications, as an aid to inferior forces to hold their own, we referred to in the chapter on Fortification. It is not necessary to enlarge further upon the subject, and here we can close our study of the effect of aircraft, in

their present stage of development, upon an army's first mission in war, the defeat of the hostile army.

It is necessary at this stage to recall the purpose underlying the employment of armies. One nation employs them to defeat the armies of another, and the object is to bring the war to an end upon advantageous terms; the point in dispute must be conceded by the hostile population. According to some writers, the measure of resistance offered will be the importance of the point in dispute, and its influence upon the well-being of the nation, and it will be as well to allude briefly here to the use of aircraft for breaking down this resistance. We dealt with this question before, and came to the conclusion that the effect produced by aircraft in their present stage upon the issue of a war may be looked for in the influence they will have upon the naval and military forces, the fleets and armies, rather than in the direct pressure they will bring to bear upon the civil population. We based our conclusions upon the small numbers of flying men compared with the population to be dominated, and upon historical experience of the difficulty of forcing the population of a defended town to give in by bombardment alone, unless bombardment can be combined with starvation. We must note here that if the population of a country is crowded into comparatively small areas, and if by some method the means of livelihood of the people can be interfered with, so that they are

on the verge of starvation, bombardment by aircraft may weigh down the scale and bring about surrender. This subject is treated at greater length in the chapters on other branches of strategy.

To the other methods employed by armies to bring pressure to bear upon a hostile nation, the occupation of capital cities, or of communications and centres of distribution, no further reference is needed.

AIRCRAFT IN AMPHIBIOUS WARFARE

When we consider the influence of aircraft upon the combined operations of fleets and armies against a hostile fleet, or a hostile army, we find that at present they must be looked upon as an auxiliary arm. In some cases, as we have seen, a fleet assisted by aircraft may be able to dispense with the help of an army in dealing with an inferior fleet sheltering in a defended harbour. Aircraft when carrying observers may greatly increase the effectiveness of sea bombardments, and also of land bombardments, if an army is assisting. With aircraft at their disposal, it is probable that the Japanese would have been saved the loss of thousands of their soldiers in the siege of Port Arthur; if the fall of the Japanese shell could have been accurately observed from the air, the Russian ships might have been destroyed without the capture of 203 Metre Hill as an observation station. This

principle can be applied, not only to fleets, but to all war vessels and commerce destroyers which may shelter in harbour, and be secured by fortifications from attacks by sea forces. Hitherto the combined operations of naval and military forces have been necessary in such circumstances ; in future air forces may suffice, not only on account of the increased facilities they afford for observing the effects of gunfire, but also because of their own destructive powers, which are constantly being improved. In the near future it may be impossible for war vessels to remain securely at anchor, or in dock, within the radius of action of hostile aircraft. In fact, the time may be approaching when it will no longer suffice to study strategy from the ' amphibious ' point of view, the issue will be decided in the air, as well as by sea and land ; strategy must then be decided ' in three dimensions,' and the relationship between time and space in the movements of the different forces will require careful study. Roughly speaking, aircraft may move about five times as fast as ships, and thirty or forty times as fast as armies.

COMBATS BETWEEN AIRCRAFT

It is a principle universally accepted that strategy by land and sea should be directed to bringing about combats on favourable terms. It is interesting to speculate whether the same rule will apply to the air.

As regards human endurance, we have a recent example in history of Japanese seamen swimming by night into the defended harbour of Port Arthur, to try and fix explosives against the sides of the war vessels which they were attempting to destroy, and some of the land mining operations in the same war were conducted under conditions involving practically certain death to the miners. We have no reason to assume that the pioneers of the art of flying, who have faced the grave risks which attend the exercise of their art, are likely to be behind the seamen and soldiers on sea and land in facing the risk of destruction by the enemy. We must realise, however, the importance of considering the object in view, when deciding that human life must be sacrificed in its attainment, and the question will always arise as to which of several objects is the most important; at the present day the men skilled in flying are few in number, it is not every one who is suited to such work, and a year's practice is usually required for proper efficiency.

Following up this line of thought, it will be as well to recapitulate the functions which are required of aircraft in wars of the present day. These functions, as we have seen, are for the most part auxiliary, they help fleets or armies as the case may be to defeat their opponents. The means by which they do this are twofold, firstly, by obtaining and reporting information, and,

secondly, by their destructive power. It may be advanced that either of these operations may involve a combat with hostile aircraft, and our present purpose is to decide whether such combats should be sought or avoided.

It is not possible to lay down any rigid rule in this or in any other branch of the study of war. All we can do is to make up our minds what the most effective course would appear to be, as far as we can judge from the limited data at our disposal. We have practically no war experience from which we can draw deductions. If we are correct in our conclusions that aircraft themselves are not likely, in their present stage of development, to settle the issue of a war, and that their importance must be measured by the effect that they can produce against fleets or against armies, then it seems that they can most effectively be employed in helping or attacking such fleets or armies, rather than in attacking each other.

As regards their function of gaining information, a subject of almost infinite importance in strategy, we have something to go upon in the similar function performed by cavalry in land warfare. It is accepted as a principle that, with cavalry, information must be fought for *if it can be obtained in no other way*; if it can, the cavalry had better be saved for employment in the decisive battles, or for pursuit of a beaten enemy. There are occasions on record when cavalry have fought for the sake of fighting; they have been

launched at the enemy's cavalry, and have thereby lost opportunities of obtaining information of infinite importance to their army headquarters. The glamour of the heroic combats which have so resulted has tended to obscure the failure of attaining the real object in view. It may be advanced that, as a general rule, cavalry cannot obtain important information without fighting for it, because the enemy's cavalry will most probably be disposed to prevent them; this is true, within limits, but there are many exceptions. There are theatres of war where a single officer posted on an eminence can obtain and report better information regarding the dispositions of a hostile army than could possibly be obtained by a whole division of cavalry fighting in the plains below. It seems reasonable to assume that aircraft, moving at high speeds in all three dimensions of space, with wide ranges of vision, and frequently with the power of concealment and alteration of course in local cloud or mist, will be in a position to decide whether they shall be brought to action or not by hostile aircraft. If obtaining information is their object, then they must avoid fighting, in order to fulfil their mission. This must especially be the case with aeroplanes, which return to their own headquarters to make their reports.

Then we have the other function of aircraft, their power of destruction. Supposing that they have the choice of avoiding actions with the

hostile aircraft, what should be their objective, the enemy's war vessels or armies, as the case may be, or his aircraft? Here again the answer seems to be that actions against aircraft should be avoided, because more important influence can be brought to bear upon the sea or land strategy by attacking the forces which decide the issues. We have noted what they may be expected to undertake with this object in view, both by sea and by land.

This seems all that there is to be said on the subject until the policy has been put to the test of actual war, and if our deductions are correct, then combats between aircraft will be the exception rather than the rule. Still we must realise that they will sometimes take place, and some day perhaps, when aircraft have developed further, and have been specialised in design to perform various functions in time of war, the local command of the air will be fought for, even as we have battles to establish, for some purpose, the local command of the seas. Under existing conditions it is conceivable that an airship may be working such havoc that it will be necessary to send aircraft to attack her, and, although outside the subject of strategy perhaps, it is interesting to consider the conditions of combats in the air.

Aircraft have three methods of fighting each other, by running each other down, by gunfire, and by dropping bombs. The first need only be

considered in exceptional and desperate cases, because it would always mean mutual destruction, giving no advantage to either side. It is conceivable that a man of great gallantry and devotion to his country might undertake to travel inside a torpedo, direct it against a hostile battleship, and blow himself to bits in the operation; he would thereby sacrifice his own life in destroying a battleship and her numerous crew. It is only in very exceptional circumstances that he would be called upon to undertake a similar operation with a view to taking the life of a single opponent, simultaneously with his own.

Either for effective gunfire, or for bomb dropping, it will be an advantage to climb above an opponent, and the rate of climbing will therefore be an important quality in aircraft designed for combats with their own kind. In this connection we noted that airships can climb rapidly by throwing out ballast, and also by the use of planes at certain speeds. Ballast once thrown out cannot be replaced, and aeroplanes therefore have the advantage in prolonged up and down movements. They can also mount higher, because they are less dependent upon the density of the air, and they have the advantage of higher speed.

Dependent as they are upon the most delicate adjustment of material appliances, made as lightly as possible to give the strength required, aircraft when on the ground will afford very vulnerable and comparatively easy targets, and

if so caught unawares they will have but little chance of mounting in time to avoid the danger.

With this note we can conclude. The exponents of the art of flying have won the most serious consideration from those who are responsible for the conduct of warlike operations. We are probably far from the time when the air armies or 'aerial navies' will settle issues between nations in regions far above the earth's surface, but no one who has followed the rapid development of aircraft during the past three or four years will venture to predict the extent of their increased influence in the future. Whatever their future development may be, we can deduce, from experience of strategy on land and sea, the principle that where one side can employ mobile forces, the other side requires equally mobile forces, in whatever element they move; the sky strategist, like his contemporaries on sea and land, must decide what proportion of his forces he will use for attack, and what proportion must remain temporarily on the defensive, to guard local interests. Sedentary defence can only be effective in so far as it aids the strategy of the mobile forces which ultimately decide the issue.

CHAPTER X

ON THE INVASION OF ISLANDS

Interest of problem—*Invasions*: Various islands—Outlying islands—United Kingdom—Cost of sea transport—Present-day conditions—Secrecy—Rapidity—Voyage—Beach landings—Wharf landings—Force for invasion—Conclusions—*Raids*: Objectives—Naval—Military—Popular—Forces for raids—Summary.

It is not easy to take a detached and impersonal attitude regarding the special branch of strategy which is concerned with the invasion of islands, because of its immediate interest to the population of the United Kingdom. At various times in the history of the British Islands there have been periods when sea forces have been weak in comparison with those of our prospective enemies; hostile armies have been a real menace, and invasion, defined as an operation conducted for the conquest and domination of the country, has at times been actually accomplished. The last occasion upon which England was so conquered is eight and a half centuries ago, but during the intervening period there have been several occasions when, owing to weakness at sea, there seemed to be a possibility of the operation being repeated; we are accustomed to hearing the views of those in the present day who consider that owing to relative naval strength, to the changes wrought in the conditions of movement

on and below the surface of the sea, or to recent developments in the art of flying, the prospect of the country again being invaded is by no means remote. The question has been so fully discussed from the point of view of the islander, that it will be as well for us in this chapter to look upon it rather from the point of view of the invader : on this aspect of the question little has been published, although doubtless there are voluminous appreciations of the situation in the secret archives of continental military powers.

The subject we are dealing with covers not only our own islands, but islands in general, and in these circumstances it is necessary in the first instance to look round the world and study the various natures of island objectives. For this purpose it will be convenient to divide the various sorts of islands into three classes. In the first we can put those containing the capital city, the centre of organisation of the National or Imperial organisation, and a large national population. In this category we put the United Kingdom and Japan. The second class includes islands such as Australia and New Zealand, which contain nations of the same race as the mother country. In the third class we can put islands populated by an alien race, with few settlers from the mother country, and possibly a garrison and defended harbours to ensure such security as may be required. The Dutch East Indies, the American Philippine Islands, the

islands in the West Indies under the flags of various powers, and our own 'possessions' distributed over the globe, afford examples of this class.

To outlying islands we need only to refer very briefly. The sovereignty over those which are peopled by alien races depends almost entirely upon two factors when such sovereignty is challenged in war : upon their geographical position, and upon the relative strength at sea of the belligerents. To maintain such sovereignty it is essential that the sea route to the home country shall be secure. The garrisons may hold their own for a time, but they will require relief or reinforcement sooner or later. The country which controls the sea route will be in a position to blockade such islands and cut off supplies, and will also be able to send large military expeditions to attack the garrisons ; the other country will only be able to send encouraging messages. The ultimate result in such circumstances is a foregone conclusion. In the Spanish American War of 1898 the destruction of Cervera's fleet prevented any prospect of the Spanish garrison of Cuba being reinforced from the home country ; the island was surrendered to America, although only about 16,000 American troops had been landed, and the Spanish garrison amounted to nearly 200,000. The inhabitants were hostile to Spanish rule, and this is an important point to consider in connection with such operations. The naval

power deciding to launch an attack against outlying islands must be prepared to use a strong enough military force not only to defeat the garrison, but also to dominate the population if they should resist the new rulers. The United States were confronted with a serious problem of this nature in the Philippine Islands.

Where, as in the case of Australia and New Zealand, the islands contain nations of the same race as the mother country, the transfer of sovereignty is much less easily accomplished. If the population resented it, they could prevent the effective occupation of their country for a long time, and even if their regularly organised armies were defeated in battle, and their principal towns were occupied by an enemy, they could still adopt the tactics which were employed by the Boers for three years in the South African War, and every week of resistance would increase the probability of the control of sea communications being regained. It would be necessary for the invader, even if he conquered and occupied the whole country, to make sure that he was strong enough at sea to control the communications permanently, otherwise whatever military forces he employed would be cut off from support, and would ultimately be obliged to surrender.

Considering the invasion of outlying islands as a problem of strategy, we at once recall the fact that the forces at the disposal of the naval or military strategist are not unlimited. The prin-

ciple of concentration of purpose must always be borne in mind, and the purpose will be to defeat the forces which the enemy can put upon the sea or into the field. Accordingly, before deciding to launch an attack against an outlying island, the purpose in view must be distinctly determined, or such operations will involve expenditure of valuable strength in men, money, and material which could better be employed elsewhere.

An attack upon an outlying island may be sound strategy for two reasons, either because it may be expected to have an effect upon the issue of the war, or because it may influence the terms of peace. In order to affect the issue of a war it is necessary, as we have seen, that an operation should produce some result, whether direct or indirect, upon the enemy's fleet or army. It is not probable that his main army will be affected seriously, because the conditions of relative strength at sea which enable us to carry out the invasion will in any case prevent him from sending an army across the sea to the same destination. We cannot expect to draw any strong portions of his army away from more vital points by attacking an outlying island. Fleets require further consideration.

The great advantage, perhaps the only advantage, of the possession of outlying islands in different parts of the world, if we look upon them purely from the point of view of the naval strategist, lies in the secure harbours and resources

which they may contain for the use of war vessels, and possibly of merchant ships. Excepting for such uses, they become a source of weakness rather than of strength to the country to which they belong; their garrisons are isolated and liable to attack unless friendly war vessels can control the sea routes lying between them and bases from which hostile expeditions can be launched. The relief of these garrisons if so attacked may entail the dispatch of squadrons urgently required elsewhere, and it is only necessary to quote the case of Port Mahon in Minorca, at the period in our history when it was a British possession and the French fleet held the local command of the sea in the Mediterranean, to illustrate the drawing power of an outpost of this nature. Port Mahon was ultimately captured from us, but not before we had risked the defeat of the weak squadrons which were all that we could spare to attempt its relief. The moral of such cases is obvious, and we can deduce that, by invading an outlying island, it is possible under certain conditions to cause the enemy to attempt to save the garrison. This applies not only to islands, but to all outlying territories in which troops are stationed. All troops so situated are a constant source of anxiety to the naval strategist on whom falls the responsibility for any disasters that may happen if they are not supported, and the difficulty of such support is accentuated under certain geographical conditions, when the out-

lying island or territory is nearer to the hostile country than to the homeland. Admiral Byng was shot for not relieving Port Mahon, and the incident has not been forgotten; the lesson we can deduce from this and other historical examples is that, by attacking an outlying island, it may be possible to draw hostile squadrons away to distant seas, and so produce a definite effect upon the issue of the war.

The other reason for such attacks or occupations, the prospect of influencing the terms of peace, does not require quite such lengthy treatment. As long as the issue of a war is in doubt, it would be highly dangerous to detach for such a purpose forces which may be required to take part in battles at the decisive point, but instances occur when the result of a war can be predicted with confidence, and forces can be spared from the decisive area to conduct subsidiary operations of this nature. As examples we can quote the Japanese occupation of the Pescadores Islands in 1895, and of Saghalien in 1905; also the occupation by the Americans of Porto Rico and of the Philippine Islands in 1898. Where a country has oversea possessions, and a navy so inferior as to be negligible, such possessions can be taken from her by a hostile naval power, not a neighbour by land and therefore immune from attack, and there will be no chance of retaining them, or of retaliating. When Italy took certain 'over-sea possessions' from Turkey the result was a

foregone conclusion on account of the weakness of the Turkish fleet.

From operations against outlying islands as a strategical measure, we can now turn to the invasion of an island which is the home country of the belligerent nation, and here we may as well give up the purely abstract study of the question and deal at once with attacks of this nature upon the United Kingdom. Only two of the world's naval powers have their headquarters upon islands, the British and the Japanese, and the British problem presents the greater interest. We will consider it from the attacker's point of view, rather than from the defender's, because, when considering war problems from the defensive point of view there is always a tendency to 'make pictures' and to attribute to the attacking forces ubiquity and other attributes never assumed for one's own forces.

In all strategical problems the first step is to ascertain the conditions of the individual case. Following this plan we will assume in the first place that we have at our disposal sufficient military force to conquer the United Kingdom, and force the British nation to make peace with us on terms favourable to ourselves, provided that we can get our army into the United Kingdom, and maintain it there for a long enough time to achieve its purpose. If our continental neighbours are likely to be unfriendly, this military force must be over and above those that

we require on continental soil. Furthermore, we assume that we have at our disposal sufficient merchant shipping to carry an army of the required strength across the sea. We must face the fact that our navy is inferior in total strength to the British, and troops in transports being vulnerable and helpless if caught by hostile war vessels during the voyage, we must make such arrangements as will minimise the risk to which they are exposed. Apart from the question of relative naval strength, the two principal conditions we want to ensure with this object in view are secrecy and rapidity. Let us examine these conditions one by one.

In order to ensure that the condition of relative naval strength shall be as much as possible in our favour, it would obviously be to our advantage to induce the British Admiralty to send away from home waters as many war vessels as possible, and to send them so far away that they cannot be recalled in time to oppose the transfer of our army to the United Kingdom. Here we must note the introduction of wireless telegraphy, and the facilities it affords for concentrating all war vessels that may be within range of the wireless stations. This we note as a condition that did not obtain in the old naval wars, and we also note the change from sails to steam as a motive power. In the old days vessels to leeward could not move directly to the point required, and the time required for such movements could not be

calculated; it depended upon fickle weather conditions which could not be predicted. The time required for the movement of steam vessels in any direction can nowadays be calculated with precision.

We shall presumably have studied British Royal Commission reports like the one on the supply of food and raw material, and public statements of British ministers, and we may have studied for ourselves the various Blue-books containing statistics of the conditions of life in the British Islands. From these studies we have doubtless assumed that the well-being, and even the existence, of the crowded population of the United Kingdom depends upon the cost of sea transport. If we can send up the cost of war insurance by attacks distributed about the most vital of British trade routes, we may possibly raise the cost of sea transport to such a figure as to produce great distress amongst the population, and our object in so doing will be to force the British Admiralty to detach war vessels from home waters to protect the trade routes. If by arming our merchant vessels and turning them into commerce destroyers in distant seas, while keeping our regular war vessels in home waters, we can induce the British to use war vessels against such commerce destroyers, we gain a great strategic advantage. If we send our main fleet, or any of our war vessels, away from the decisive point we gain no relative advantage to aid

our purpose of invasion, unless we can thereby draw away a superior naval force. Taking the extreme case, if we sent our whole navy away, and the British sent an equal force after it, the British would still have enough naval force in home waters to deal with our unescorted transports.

The next condition to which we referred was secrecy. Here we find several points in our favour. In the days when communications by land were bad, and harbours held few facilities for embarking troops and the material that accompanies an army, the usual practice was to assemble the army destined for invasion at some convenient port or ports. Special vessels for their transport were collected or built there, and the whole operation was conspicuous and deliberate. Nowadays a network of railways runs from the different military centres to the best harbours, trains can be run alongside quays, and the troops can walk on board suitable vessels along gangways or 'brows'; their guns and stores, and if necessary, horses and transport animals, can be rapidly hoisted on board by the appliances on the quays. The whole operation can be kept secret until the last minute, and steps can be taken to delay the news leaving the country. Under favourable conditions a considerable proportion of the military force required could be at sea before news of the proceeding is likely to reach England.

As regards rapidity, we know from published reports that in 1904 a force of about 11,700 men, with 2700 horses, 61 field guns, and 315 vehicles, besides motors and bicycles, was put on board 10 transports at Southampton in 12 hours, and we shall, of course, have studied every detail of our own harbours and embodied experience we ourselves have gained during manœuvres and exercises held since that date. With the rapidity of entrainment and the movement of troops by rail to the ports we are, of course, familiar, as such work is constantly calculated in forming our war plans against continental military powers. Every possible minute will be saved, and all requirements in rolling stock, platforms, sidings, and other appliances will have been foreseen. For rapidity during the voyage it is important to select speedy vessels as transports. This will present some difficulty; the ordinary trading vessels cannot be very speedy if they are to be run at a profit, and it is improbable that we shall have enough fast tonnage available for the whole army required. If not, then we had better send as many troops as possible in fast vessels, and let the remainder follow in less speedy ones. How to distribute the force amongst the different vessels will depend upon our plan for landing and after landing, so everything must be worked backwards from the enemy's end of the operations, and the embarkation organised accordingly.

The next step will be to get the transports across the sea to their destination, and to ensure their security during the voyage. The question will arise whether it is better to assemble them and cross all in one body, or to start independently from several ports and meet off the enemy's coast. A large convoy is conspicuous and offers a large target if sighted; if not so sighted the whole will be equally safe during the voyage. With transports crossing independently, the whole number are not likely to be attacked, but, on the other hand, it is most improbable that all will escape the vigilance of the enemy. Which-ever method may be adopted, it is essential that the whole operation shall now be pushed on vigorously. The arrangements we have made for secrecy, and for evasion of the hostile war vessels, can only be effective for a time, and soon we must expect to draw superior naval forces to the decisive point.

We must here study the question of naval escort. This we require for three purposes—(1) to drive off the hostile war vessels, torpedo craft, and submarines which we may meet during the voyage, and up to the time when the transports have been emptied; (2) to engage land batteries, if we have selected a harbour, and not an open beach, for disembarkation; and (3) to assist our troops by gunfire in overcoming resistance offered on land. It is important for us to study the relative advantages of harbours and open

beaches for the purpose, especially as regards the saving of time and the chances of overcoming or avoiding opposition.

As regards the saving of time, the first question we have to consider is the question of weather. It may be impossible to land on an open beach at all for several days, and a plan involving the probability of such delay, and the attendant risks from the enemy's war vessels, seems hardly within the range of practical procedure, excepting for comparatively small forces. Next we note that for beach landings suitable boats are required with some means of getting them from the transports to the shore, either by towing vessels, or by their own motive power. Suitable boats are heavy, and the transports must have appliances for hoisting them out quickly. Then it is clear that the time factor will depend upon the distance the boats have to traverse from the transports to the beach, and in order that this distance may be as short as possible we must either select a place where there is deep water close to the shore for the transports to anchor, or these must be small vessels with shallow draught. In either case it will probably be wise to anchor with as little water as possible under the vessels' bottoms, because it is almost impossible to guard the transports against the attacks of torpedo craft, which we may expect to be soon on the spot, and there will be a better chance of saving the lives of some of our troops if the vessels sink in

shallow water. But for this condition to be fulfilled there must be not too much rise and fall of tide. A strong current is also undesirable, as it causes much delay for boat work. It will be seen from the foregoing that beach landings have many disadvantages, excepting under favourable circumstances; still they were successfully conducted in spite of acute difficulties in the old sea wars, especially on the coast of Holland, and on Belle Isle. Abercromby's landing in the face of opposition in Aboukir Bay was conspicuously successful, but this can hardly form a useful precedent for landing on the coasts of the United Kingdom, because of the difference in the average weather conditions.

Against the disadvantages of beach landings we can put one advantage, and that is the prospect of avoiding serious opposition, but we can hardly expect to conduct military operations in the United Kingdom, on a large enough scale to conquer the country, with only a beach landing behind the army we employ. We must therefore make our plans to seize a convenient harbour, and our beach landing, if made at all, will probably be made only in sufficient force to achieve this object. To harbour landings we will devote our next attention.

Here we are confronted with the difficulty that most suitable harbours are defended. To bring our helpless transports under the fire of heavy guns, and within the sphere of torpedoes and

mines, seems to be taking somewhat prohibitive risks. It is essential then that a sufficient naval escort be provided—(1) to prevent the guns on shore from hitting the transports, not an easy matter; (2) to clear a passage through any mines there may be; and (3) to keep off hostile torpedo craft. If we can once get inside the harbour, and the wharves are clear of shipping, then we can land our forces rapidly, and if we have silenced the batteries, our naval escort will have a good chance of preventing attacks from the sea upon the transports inside. But for a rapid disembarkation on the scale required we shall want a vast amount of wharfage accommodation, and the harbour must be extensive enough to hold all the vessels carrying the army. Wharves of this nature in most British ports are surrounded with many acres of narrow streets, and generals are notoriously averse to handling their forces in the streets of a hostile town. Street fighting is not an attractive prospect for any army, and we shall have noted that an official pronouncement has recently been made in the House of Commons that under the provisions of the Regulations respecting the Laws and Customs of War on Land (Hague 1907) the inhabitants of a country taking up arms in its defence are entitled to be regarded as belligerents, although not possessing uniform nor belonging to any organised military force.

So far we have considered only the conditions

affecting the problem of getting to the United Kingdom an army large enough to overcome the military opposition with which we may expect to be confronted, in attaining our object of conquering and subjugating the country. We must make our own estimate of the force that we require for the purpose, which will, of course, depend upon the conditions at the time, and especially whether the whole or a portion of the British Regular Army is in the country, whether the Territorial Army has been mobilised, and for how long it has been undergoing training. The larger the army we use, the greater the difficulties of getting it across the sea and finding suitable harbours for its disembarkation. We note the British official estimate that 70,000 is a minimum estimate of the force which we are likely to consider effective for our purpose. It would seem to us to be foolhardy to make the attempt with so weak a force if the British Regular Field Army were available to oppose us, and, as regards the Territorial Army, we must form our own estimate.

Whatever estimate we may form, we must make a definite plan regarding what our army is to do after landing. We must not only defeat any British forces that can be brought against us, but also we must strike at some vital interest seriously affecting the population. We are familiar enough with writings and speeches in the United Kingdom bewailing the loss of all national spirit and of patriotism, but we are

not certain whether it is safe to base our plans upon such material. We seem to have read that similar assertions have been made before, especially after periods of prosperity, when there has been no common interest to bind the people together to face a common danger. It is within our remembrance that a few years ago the ultimatum presented to Queen Victoria by President Kruger raised a wave of patriotism over a matter which did not touch the nation's immediate interests to the extent that they would be affected by a hostile invasion, and we also note the success of organisations based upon patriotism, such as the Boy Scout movement and others.

On the whole, then, we come to the conclusion that we must use an army strong enough to win not only one battle but several, and subsequently to strike at some vital interest, whereby we can bring such serious pressure to bear upon the population that the British Government will be compelled to sue for peace. We cannot expect to do this rapidly with a flying column living entirely upon the country; we must have a secure base, and regular lines of communication which must be suitably guarded. All troops we use for this purpose must be deducted from the field army available to fight battles, and, since the operations will take an appreciable time, we cannot expect the measures we have taken in order to cause the British to weaken their naval forces in home waters to be continuously effective.

We must base our plans on the assumption that our army will be cut off from communication with its own country. We may possibly expect to live upon the country's resources as long as our army is not compelled to concentrate to fight, or to halt for too long in one place, but we cannot expect to replenish ammunition. A sufficient supply for the whole operation must be landed at the base, and some means must be devised for transporting it to the army when required.

Such is our problem, if we contemplate invasion, as we have defined it, of an island like the United Kingdom, without first defeating decisively the hostile sea forces. On the whole, it is probable that we shall be inclined to agree with the opinion of the British Admiralty in November 1910, and 'taking all these facts into consideration,' we should probably decide 'that an invasion on even the moderate scale of 70,000 men is practically impossible.' But we should also note that the question is one of relative naval strength ; not relative total strength, but strength that can be brought to bear at the decisive point in the time required for an army to be transferred to the United Kingdom, and to accomplish the subjugation of the country. We should consider the present situation, rather than that in former years. The Admiralty opinion was given in 1910, when the British fleet was relatively stronger in proportion to the fleets of continental powers than it is now, but we have at

our disposal a later statement (February 1914) by the Prime Minister,¹ based upon the considered judgment of an important and representative committee, that the British Navy is still capable, 'as capable as it ever has been,' of protecting the United Kingdom from anything in the nature of serious invasion.

Having the same facts before us we should probably come to the same conclusion upon them, and await the chance of the naval situation being more in our favour before undertaking 'invasion' of the islands in question, defined, as the British Prime Minister¹ defines it, as the landing of a force dispatched with the object of conquering the country. Before attempting such conquest we must first conquer the main British fleet.

Although we may come to this conclusion regarding invasion, as an operation of such primary importance in our strategy, it is still open to us to consider the advisability of launching military forces against the United Kingdom for subsidiary operations, especially if by such means we can produce an appreciable effect upon the British fleet or army. This we shall succeed in doing if we can cripple British war vessels, or if we can force the British to keep in home waters war vessels required in other parts of the sea, or if we induce them to retain in the United Kingdom troops that could be more effectively employed against us elsewhere. We noted that the main

¹ Mr. Asquith.

difficulty with which we are confronted in drawing up a plan for 'invasion' is the difficulty of getting a large enough force across the sea and into the United Kingdom, and of maintaining it there for a long enough time to achieve our purpose, in view of the naval situation. This difficulty does not apply to the same extent to smaller forces. These would have a better chance of evading hostile war vessels at sea, and much less time would be required for the critical operation of landing. After landing, they would find it easier to live on the resources of the country, and would therefore want a smaller proportion of vehicles to collect and transport supplies. Invasions of this nature on a small scale have usually been called 'Raids,' and we will use this term, while reserving for the expression 'Invasion' the technical meaning given to it in official quarters in Great Britain.

RAIDS

If invasion can be defined as an operation with a positive object, that object being the subjugation of the hostile country, we can look upon raids as operations on a smaller scale with some relative object. The measure of their value in a strategical plan will be the effect they can produce upon the issue of the war. Wars being ultimately won by fleets or armies, concentrated at the right time and the right place to fight battles, it follows that the importance of a raiding

force can be measured by the effect produced upon the movements or efficiency of the main fleets or armies. Let us see how such effects can best be produced.

On the subject of landings Von der Goltz writes: 'The weakness of all landing expeditions consists in the fact that owing to the difficulty of transporting troops by sea, their number will always be limited, and the proportion of cavalry, artillery, and wagons in particular will be small. This makes bodies of troops which have been landed ill-adapted for a rapid and distant advance from the coast,' and, in connection with the same subject, he estimates that the initial strength of landing forces can scarcely ever exceed 40,000 to 50,000 men, and that 'the time for such expeditions is at the very commencement of hostilities, when all field troops are on their way to the frontier and their distracting effect is most felt, or else quite at the end, against a defender already worn out and weary of the war.' Von der Goltz, as a soldier brought up in the continental school of purely military strategists, naturally takes the purely military point of view, and considers only the effect that such raiding forces can produce upon the army of a hostile continental power; it is necessary to our purpose to take a wider point of view and to consider the effect upon naval as well as upon military forces. We must also consider the effect that successful raids are likely to produce upon

the attitude of the population in general, and, through them, upon those responsible for the conduct of the war. Whichever aspect we take, it will be conceded that, in order to produce any appreciable effect, it is essential that each raiding force shall be given some definite objective, something of which the loss or destruction will seriously affect the issue of the war. A raiding force might succeed in its landing and in subsequent marches, but if it moved only over Scottish deer forests and grouse moors, or over heather or down country in other parts of the United Kingdom, no such results could be attained, and every hour wasted in such movements would increase the opposition to be encountered before reaching any vital objective. No study of the employment of raiding forces in amphibious strategy would be complete without considering the definite damage which such forces could do, and such study is of great service in tending to reduce the moral effect they could produce, and to prevent this effect being out of all proportion to the real damage. Let us examine then the nature of the objectives, and the definite effect of their loss upon the navy, the army, and the population, and here again let us take the point of view of the raider.

RAIDS ON NAVAL OBJECTIVES

We can classify the objectives selected in order to affect the naval situation under two headings,

the first being the ships themselves, the second being the resources which war vessels of all kinds depend upon for their movement and fighting power. As regards the ships themselves. We can hardly expect to produce any effect against those which are manned and in a full state of sea-going efficiency. Military raiding forces alone could do nothing to hurt them. It might be possible to induce them to quit a harbour, but no advantage would thereby be gained unless we could provide a superior naval force to meet them at sea. The only war vessels that could be selected as objectives for raiding forces would be those that could not move, namely those approaching completion on the building slips or in docks, and the completed ones in dry dock for repair.

As regards the resources upon which war vessels of all kinds depend for their movement and fighting power, we have a wider choice. We need not go into this subject in detail again, as we studied it in the chapter on Fortification, and it suffices here to recall the fact that war vessels depend for movement and for fighting upon coal, oil, lubricants, and ammunition. Reserves of these things offer tempting objectives. Shipbuilding resources, and factories of various natures of war material, enable an enemy to repair the wastage of war and to reinforce and replenish the fleet: these again afford objectives. So do the various means of exercising control

over naval movements and passing intelligence, such as wireless stations and cable landing-places. The chief protection of these objectives lies in their great number, and the difficulty of destroying enough to effect any appreciable result. It is inconceivable that objectives of which the loss would seriously affect naval strategy will be left entirely defenceless, and raiding forces must therefore be strong enough to overcome the resistance of any sedentary defenders, who will be aided by defences and obstacles, and even if the hostile field forces are successfully evaded on the way to the objective, they cannot be evaded for long; what damage is to be done must be completed in a short space of time. Many, if not most, of the obstacles we have referred to are situated in the heart of some city, and cannot be got at by raiding forces except by passing through streets, with all the attendant prospects of street fighting in which the best troops hesitate to embark. All the conditions tend to rapid action; deductions in regard to the composition and equipment of raiding forces will be referred to later.

RAIDS AGAINST MILITARY OBJECTIVES

We are dealing with raids upon military forces in an island here, so we must exclude consideration of the very effective raids upon an army's lines of communication, to which we referred in earlier pages, because the existence of such lines

of communication would imply that the army was operating against some other army in the same island. This could only occur if the raids were made subsequently to a successful invasion, and conditions at sea rendering such invasion possible would render raids unnecessary. It is not conceivable that the population of the United Kingdom could hold out for very long under such conditions, and raiding forces would hardly accelerate the issue for long enough for it to be worth while to employ them in addition to the invading army. For raiding forces, without 'invasion,' in the early stages of a war, the most tempting objectives would be the mobilisation centres of the units of the army, if they can be reached in time to produce an effect, the ammunition factories and magazines, and the railway and telegraph lines required for communication. The object of such raids might possibly be to prevent military forces being sent from the United Kingdom to do any damage elsewhere, and here again, to be effective, they must be sent off early. For raiding forces later in a war it is not easy to imagine any effective objectives from a purely military point of view.

RAIDS TO FRIGHTEN THE POPULATION

There is some prospect of producing a serious moral effect upon the population of a country that has not seen hostile military forces within its borders, and has no knowledge of their pro-

cedure, or of the actual measures they are likely to take to the detriment of the non-combatant civilians, who form the large majority of the nation. Military forces employed on such a venture would, of course, play upon this moral effect to the utmost, and with this end in view might select great industrial centres, or even London, as their objective, though there would always be a feeling of doubt at the back of the military commander's mind as to the measures he would take if his threats of vengeance were not responded to. It would probably be more effective to select objectives of which the destruction or capture would produce a definite effect upon the naval or military forces, and trust that at the same time a sufficient moral effect would thereby be produced upon the population to bring about panics, and 'stop-the-war' mobs, to hamper the Government of the country in their conduct of the war. There is always the possibility of producing the opposite effect, and exasperating the population with the raiders, rather than with their own Government.

COMPOSITION OF RAIDING FORCES

In all cases the action of raiding forces must be rapid to be effective. The passage across the sea must be rapid to evade hostile war vessels. The landing must be rapid to avoid interference by the naval forces that will hasten to the spot as

soon as the alarm is given. Subsequent movements must be rapid, as the objective must be reached and destroyed before superior forces can assemble and defeat the raiders. For the first stage, rapid transports must be employed. For the second stage, the landing, we are confronted with the difficulty that horses are wanted for subsequent rapid movements, but, on the other hand, horses take a long time to land. For this reason bicycles, which are landed easily, and require no forage, may be preferred, excepting for the gun horses which may be required if the raiding force cannot expect to carry out its mission without the help of artillery. Four-wheeled vehicles, again, take a long time to land, and two-wheeled carts are preferable for that reason. Something is wanted to carry ammunition, even if the force is to rely entirely upon supplying itself with food and water in the country traversed. For the third stage, the land movements, it will be an inestimable boon to the raiding force if the transport of the country is left within its reach; it seems possible that in a country populated for the most part by people ignorant of the conditions of military movement, there is some chance of such transport being obtainable, and the object of the raiding forces being much facilitated thereby.

In circumstances favourable to their employment, raiding forces seem to be an effective weapon at the disposal of the 'amphibious'

strategist. The important points to be considered are the risks to be encountered, and the definite results to be attained in order to justify such risks; the strategist must balance these considerations. In launching military raiding forces against an island, the chances of their crossing the sea safely depends upon the question of relative naval strength, and will vary inversely with the size of the raiding force. If they succeed in landing, the chances of attaining their objects will depend upon the rapidity of their movements, the availability of supplies and transports of the country for their use, the system of watching and reporting their movements, and the strength and organisation of the defender's forces. The definite results to be expected will depend upon the importance and vulnerability of the objectives, and the effect of their loss or destruction upon the islanders' sea and land forces, chiefly the former.

SUMMARY

When looked at from the invader's point of view, it is impossible to avoid the conclusion that invasion, defined as a primary operation with the object of conquering and subjugating a densely populated island, is not to be undertaken by a weaker naval power without first, by some means or other, defeating the islanders' sea forces in battle. 'Invasion by evasion' is not a practical proposition because of the time such an operation

would require. For such an operation to have any reasonable prospect of success the islanders' main fleet must be induced to move so far away that it could not get back until the subjugation of the country had been accomplished. Sane strategists would only send it as far away as that after the main fleet of the invader, who, being weaker at sea, would then be unable to employ, in close contact with the vessels transporting his army, an escort strong enough to save that army from destruction before the landing could be accomplished. Torpedo craft under favourable conditions can sink even battleships, if they are ready to risk their own destruction; they can sink transports under any conditions without any appreciable risk to themselves.

Raiding forces, on the other hand, might succeed by evasion. The smaller the raiding force the easier such evasion would be, but the strength must be sufficient to overcome the defenders, and to accomplish the object in view if the objective is seized, before interference by hostile field forces. A raiding force, even if so far successful, would soon be in desperate straits. By rapid movement to some harbour where a rendezvous had been arranged with vessels to take it to sea, and by a wonderfully well-timed simultaneous arrival of troops and transports in that harbour, it is just possible that the force might escape to sea, and even to its own or a neutral country, but as a rule desperate ventures

of this nature would end in the destruction or capture of the whole raiding force. Men and leaders capable of undertaking such operations are few in number.

We have assumed in the foregoing remarks that the United Kingdom contains both sedentary forces to defend objectives for raids, and mobile field forces to oppose a force of the maximum strength that can land, and live upon the resources of the country during movement; we have further assumed that full advantage would be taken of the length of coastline to land unexpectedly in some sheltered anchorage from which the raiding force can reach its objective, and accomplish its object, without meeting a superior force.

Similarly, invasions of outlying islands require the naval control of the local sea communications for a sufficient time to achieve the purpose of subjugating the population, and raids by evasion require sufficiently important objectives to make them worth undertaking. Occupation of such outlying islands or territory in order to influence the terms of peace, rather than the issue of a war, comes outside the province of sea, land, or air strategy, which must have been generally successful before such dispersion of force can be desirable.

With the problem of the invasion of islands, a problem that always is, and always will be, with us, we can close our short study of sea, land, and air strategy.

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